British Society for the Study of Orthodontics 1944-45

Digitized by the Internet Archive
in 2019 with funding from
Wellcome Library

https://archive.org/details/s6867id1324628

TRANSACTIONS

OF THE

British Society for the Study of Orthodontics

1944 & 1945

London :

PUBLISHED FOR THE SOCIETY BY

THE DENTAL MANUFACTURING COMPANY LIMITED

BROCK HOUSE, 97, GREAT PORTLAND STREET, W.1

PRINTED IN GREAT BRITAIN BY L. T. A. ROBINSON, LTD., LONDON S.W.9

CONTENTS

	Page
Officers and Councillors for 1944 and 1945	4
List of Members	5
Chewing as a Therapeutic Measure	9
Our Opportunity	22
Reports of the Special Committee on Orthodontic Treatment of Elementary School Children and Post-Graduate Orthodontic Teaching (with Comments) and Undergraduate Education in Orthodontics	28
Demonstrations, 1945	35
The Orthodontist in the School Dental Service	40
A Layman Looks at Orthodontics	54
Arrested Growth of the Jaws, Associated with a "Depressed Molar"	67
Notes on Glossoptosis and Micrognathia	71
Unusual Variation in Identical Twins and its Etiology ...	82
Maxillo Facial Injuries in Children and their Sequelæ ..	87
Reports of Meetings	101
Statement of Accounts, 1944	110
,, ,, 1945	111

Members are reminded that "The Dental Record," published monthly, contains full reports of the meetings of the B.S.S.O., papers and communications given at such meetings thus coming into general circulation before they are collected and published in the Society's Transactions. Particulars regarding subscriptions to "The Dental Record" can be obtained from the Manager, Brock House, 97, Great Portland Street, W.1.

OFFICERS AND COUNCILLORS, 1944.

President	Mr. S. A. Riddett.
Immediate Past-President ...	Mrs. L. Lindsay.
Vice-Presidents	Mr. N. Gray. Mr. M. A. Rushton. Mr. C. S. Morris.
Hon. Secretary	Mr. R. Cutler.
Hon. Treasurer	Mr. H. Chapman.
Hon. Curator	Miss L. Clinch.
Hon. Editor	Mr. R. E. Rix.
Hon. Librarian	Mr. A. G. Taylor.
Hon. Councillors	Mr. T. L. Winn. Mr. C. F. Ballard. Mr. J. F. Pilbeam.
Auditors	Mr. W. L. Boness. Mr. S. B. Newton.

OFFICERS AND COUNCILLORS, 1945.

President	Mr. N. Gray.
Immediate Past-President	Mr. S. A. Riddett.
Vice-Presidents	Mr. R. E. Rix. Mr. M. A. Rushton. Mr. L. R. Marsh.
Hon. Secretary	Mr. R. Cutler.
Hon. Treasurer	Mr. H. Chapman.
Hon. Curator	Miss L. Clinch.
Hon. Editor	Mr. J. F. Pilbeam.
Hon. Librarian	Mr. A. G. Taylor.
Hon. Councillors	Mrs. L. Lindsay. Mr. C. F. Ballard. Mr. G. J. Parfitt.
Auditors	Mr. W. L. Boness. Mr. S. B. Newton.

Headquarters of the Society : Manson House, 26, Portland Place, London, W.1.

Communications should be addressed to the Hon. Secretary, Mr. R. Cutler, 8, Lower Sloane Street, S.W.1 ; or 3, Walpole Road, Surbiton, Surrey ; or any other officer particularly concerned.

LIST OF MEMBERS

[*January*, 1946

LONDON MEMBERS.

Ackner, C. A., 47b, Welbeck Street, W.1.
Ainsworth, N. J., 8, Upper Wimpole Street, W.1.
Aitchison, J., The Orthodontic Clinic, 84, West Ham Lane, E.15.
Aldred, A. B., 88, Park Street, Grosvenor Square, W.1.
Apperly, H. C., 12, Chandos Street, Cavendish Square, W.1.
Ball, L. C., 3, Park Crescent, W.1.
Ballard, C. F., 47, Okehampton Road, N.W.10.
Bell, A. W., 30a, Wimpole Street, W.1.
Bennett, Sir N., 57, Harley Street, W.1.
Boness, W. L., 12, Maida Vale, W.9.
Boutwood, R., 2, Harley Street, W.1.
Bowes, J. A., 28, South Side, Clapham Common, S.W.
Bragg, R. N., 413, Brixton Road, S.W.
Bull, F. Bocquet, 15, Upper Wimpole Street, W.1.
Campkin, H. T., 71, Harley Street, W.1.
Caseley, Miss R., Eastman Dental Clinic, Grays Inn Road, W.C.2.
Chapman, H., 6, Upper Wimpole Street, W.1.
Christian, H. B., 1, Rosslyn Hill, Hampstead, N.W.3.
Clarke, J. F. H., 67, Wimpole Street, W.1.
Clausen, Mrs. E. E., 61, Carlton Hill, N.W.8.
Clinch, Miss L. M., 27, Wimpole Street, W.1.
Cregan, T. C., 121, Harley Street, W.1.
Cross, A. B., 21, Devonshire Place, W.1.
Cutler, R., 8, Lower Sloane Street, S.W.1.
Dey, Miss I. G., 53, Portland Place, W.1.
Doherty, J. W., 140, Harley Street, W.1.
Dowsett, E. B., 12, Gloucester Place, Portman Square, W.1.
Endicott, C. L., 30, Queen Anne Street, W.1.
Fox, R. A., 13, Wetherby Gardens, S.W.5.
Freeth, H. W. F., 88, Park Street, W.1.
Fry, J. C., 17, Upper Wimpole Street, W.1.
Fry, Miss K. M., 8, Mays Court, Grooms Hill, Greenwich, S.E.10.
Gardner, S. M., 24, Upper Wimpole Street, W.1.
Garrow, A., 115, Harley Street, W.1.
Grant, H. D., 12, Manchester Square, W.1.
Grayson, J. K., 60, Portland Place, W.1.
Greenish, V. A. F., 52, Welbeck Street, W.1.
Gross, V. D., 11, Baker Street, Portman Square, W.1.
Harborow, G. J., 7, Woburn Square, W.C.1.
Hardy, E. A., 17, Harley Street, W.1.
Henry, C. B., 62, Harley Street, W.1.
Henry, C. J., 73-76, King William Street, E.C.4.
Henry, O. J., 11b, Portland Place, W.1.
Hillyard, V. W. H., 22, Rosslyn Hill, N.W.3.
Hunt, Miss W. M., 4, High Croft, North Hill, Highgate, N.6.
James, W. W., 2, Park Crescent, Portland Place, W.1.
Jennings, E. A., 1, Castlebar Hill, Ealing, W.5.
Johnson, Mrs. E. M., 57, Harley Street, W.1.
Johnson, G., 46, Lee Terrace, Blackheath, S.E.3.
Levien, L., 69, Wimpole Street, W.1.
Lindsay, Mrs. L., 13, Hill Street, Berkeley Square, W.1.
McCallin, S., 44a, Sloane Street, S.W.1.
McKechnie, B. G., 2, Harley Street, W.1.
Markham, H. R., 3, Upper Wimpole Street, W.1.
Marsh, L. R., 19, Harcourt House, 19, Cavendish Square, W.1.
Mellersh, W. F., 9, Harley Street, W.1.
Michaelis, Mrs., 22, Welbeck Street, W.1.
Morris, C. S., 88, Park Street, W.1.
Newton, S. B., Brooklands, Uxbridge Road, Acton Hill, W.3.
Oliver, Mrs. Una, 4, Spencer Hill, Wimbledon, S.W.19.
Packham, A. L., 79, Portland Place, W.1.
Parr, W. B., 30a, Wimpole Street, W.1.

Pearce, Sir F. J., 57a, Wimpole Street, W.1.
Pedley, V. G., 43, Welbeck Street, W.1.
Power, H. L., 270, Earl's Court Road, S.W.5.
Pringle, K. E., 12, Manchester Square, W.1.
Reid, D., 2, Harley Street, W.1.
Revill, W. E., 202, High Street North, East Ham, E.6.
Riddett, S. A., 42, Harley Street, W.1.
Ritblat, J. R., 35, Worple Road, Wimbledon, S.W.19
Rix, R. E., 35, Harley Street, W.1.
Roberts, C. W., 60, Harley Street, W.1.
Robinson, S. G., 14, Wimpole Street, W.1.
Schofield, J. W., 90, Harley Street, W.1.
Sharp, P. B., 60, Portland Place, W.1.
Sirey, J. S., 2, Devonshire Place, W.1.
Smyth, Miss K. C., 35, Devonshire Place, W.1.
Spiller, J. E., 64, Worple Road, Wimbledon, S.W.19.
Stephens, B. M., 60, Portland Place, W.1.
Stewart, Miss M., Dental Clinic, 10, Heathfield Terrace, Chiswick, W.4.
Still, Miss E. M., 135, Pullman Court, Streatham Hill, S.W.2.
Strange, Mrs. M. C., 55, Lee Road, Blackheath, S.E.3.
Sturridge, M. H G., 2, Knightsbridge Court, Sloane Street, S.W.1.
Sturrock, J., 19, Wimpole Street, W.1.
Sutherland, Miss J. H. M., 32, St. James' Avenue, Ealing, W.13.
Taylor, A. G., 51, North End House, Fitzjames Avenue, W.14.
Thew, W., 16, Upper Wimpole Street, W.1.
Torrance, T. A., 19a, Cavendish Square, W.1.
Tuck, R. W., 270, Earl's Court Road, S.W.5.
Tupling, L. P., 98, Harley Street, W.1.
Walker, F. A., 98, Harley Street, W.1
Wallis, S. E., 431, Footscray Road, New Eltham, S.E.9.
Warner, F. S., 88, Harley Street, W.1.
Webb, W. T. C., 25, Weymouth Street, W.1.
Winn, T. L., 62, Station Road, Chingford, E.4.
Wookey, E. E., 19, Wimpole Street, W.1.
Wright, L. D., 19, Devonshire Street, W.1.
Wydell, H. H., 1, Mount Street, Berkeley Square, W.1.
Young, Miss D., 55, Eton Rise, Eton College Road, N.W.3.
Young, Miss E. M., 55, Eton Rise, Eton College Road, N.W.3.

PROVINCIAL MEMBERS.

Bedfordshire.

Koyle, G. W., 6, Goldington Road, Bedford.

Berkshire.

Butchart, J. S., 14, High Street, Windsor.
Dickens, D. T. G., Wellington House, 175, King's Road, Reading.
Ellingham, G. H., 39, London Road, Reading.
Inman, J. E., Beechcroft, Wokingham.
Loretz, Miss M. M., Green Meadows, Ascot.
Parfitt, G. J., 179, King's Road, Reading.
Parfitt, J. B., 6, Brooklyn Drive, Emmer Green, Reading.

Buckinghamshire.

Lilley, W. A., 1, Highfield Close, Amersham.

Cambridgeshire.

Duchesne, H. W., "Hapendene," Upwell Road, March.

Cheshire.

Appleton, J., Glenburn, Marple Bridge, Stockport.
Hughes, T. M. Lister House, Broomfield Lane, Hale Altrincham.

Cornwall.

Perks, E. J., Angle House, St. Austell, Cornwall.

Cumberland.

Johnstone, J., 7, Portland Square, Carlisle.

Devonshire.

Dagger, H., Devon Villa, Newton Abbott.
Lake, C. P., 3, Northernhay Place, Exeter.
Turner J. Macdougall, Woodah, Babbacombe Road, Torquay.

Durham.

Galinsky, M., 43, Barrington Crescent, Stockton-on-Tees.

Essex.

Baker, C. D., 47, Highcliffe Gardens, Ilford.
Clarke, A. G., 8, Mornington Avenue, Ilford.
Dick, J. S., 40, Princes Avenue, Woodford Green, Essex.
Sherwood, H., 18, Goodmayes Road, Goodmayes, Essex.
Ta'bois, N. C. 33, High Road, Woodford Green, Essex.

Gloucestershire.

Johnson, W. T., Litfield House, Clifton Down, Bristol, 8.
Kettlewell, N. H., West Town Farm, Blagdon. Nr. Bristol.
Pickles, R. B., Bristol University Dental Hospital, Lower Maudlin Street, Bristol, 1.
Visick, H. C., 58, Moorend Park Road, Cheltenham.

Hampshire.

Crane, W. A., 4, St. Stephen's Road, The Square, Bournemouth.
Rushton, M. A., Rooksdown House, Park Prewett, Basingtoke.

Hertfordshire.

Brown, Miss D. J., Wayside, Luton Road, Harpenden.
Buxton, Dudley J. L., Hill End Emergency Hospital, St. Albans.
Catchpole, O. N., 6a, North Street, Bishop's Stortford.
Charles, S. W., Devonia, Rickmansworth.
Daplyn, R. G., 59, Ramsbury Road, St. Albans.
Myers, Miss E. M. c/o Nat. Prov. Bank, Barnet.
Smallbone, N. L., 4, Arden Grove, Harpenden.
Warburton, D. U., 107, Norton Way, Letchworth.

Kent.

Cross, Miss M., 48, London Road, Tunbridge Wells.
Edey, G. R., 83a, High Street, Bromley.
Hooper, K., 8, Copers Cope Road, Beckenham.
Horton, J. S. F., 46, Ridgeway, Hayes.
Scott Page, G., 65, Mount Ephraim, Tunbridge Wells.

Lancashire.

Burston, W. R. B., 15, Somerville Road, Wigan, Lancs.
Capon, P. G., 49a, Rodney Street, Liverpool.
Miller, Miss P.S., 42, Lansdowne Rd., West Didsbury, Manchester 20.
Patterson, T. B., 84, Station Road, South Shore, Blackpool.
Robb, G. C., 22, Houghton Street, Southport.
Stones, Prof. H. H., School of Dental Surgery, Boundary Place, Liverpool, 7.
Watkin, H. G., 84, Rodney Street, Liverpool.
Wilkinson, Prof. C. F., Dental Hospital, Manchester.

Leicestershire.

Downing, F. J., "Carisbrooke," 165, London Road, Leicester.
Rowlett, A. E., "Carisbrooke," 165, London Road, Leicester.
Rowlett, J. A. T., "Carisbrooke," 165, London Road, Leicester.

Middlesex.

Armytage, Mrs., Widdicombe, Kenton Road, Kenton, Harrow.
Eady, B., "Maribar," East End Way, Pinner.
Hobdell, H. G., Barclays Bank Chambers, 355, Station Road, Harrow.
Hudson, J. A., Glenfield, 431, Pinner Road, Harrow.
Mandiwall, H., 234, Staines Road, Hounslow.
Pilbeam, J. F. 5, Malpas Drive, Pinner.
Tait, R. V., Bankside, Wolsey Road, Moor Park.

Norfolk.

Bryan, H., St. Mary's Croft, Chapel Field North, Norwich.

Northamptonshire.

Wood, B. J., 5, Westleigh Road, Barton Seagrave, Kettering.

Northumberland.

Cooper, E. R., 18, Victoria Square, Newcastle-on-Tyne.
Jameson, A., 18, Jesmond Road, Newcastle-on-Tyne.
Jameson, J. T., 12, Windsor Crescent, Newcastle-on-Tyne.
Markham, L. M., 1, Victoria Square, Newcastle-on-Tyne.
Richter, L., 1, Newgate Street, Morpeth.
Samuel, B. B., Ministry of Health Regional Office, 85, Jesmond Road, Newcastle-on-Tyne, 2.

Staffordshire.

Salt, H. O., Dental Clinic, Sandford Street, Lichfield.

Surrey.

Bradley, Miss J. A., 25, Elm Way, Worcester Park.
Friend, George C., "Woodbourne," Knoll Road, Camberley.
Heath, C. A. J., Pinewood House, Worplesdon Hill, Woking, Surrey.
Hill, W. A. Sowden, 11, Barham Road, South Croydon.
Kelham, Miss M. M., 29, Park Hill, Carshalton.
Laughton, C. H. B., West Lodge, The Green, Esher.
Levin, H., 33, Hill Street, Richmond.
Mayer, J. W., Stedham House, Surbiton Hill.
Miron G., 175, Kew Road, Richmond.
Oliver, P. G., 34, Whitgift Avenue, South Croydon.
Smith, G. Richards, Rosslyn, Woking, Surrey.
Townley, S. G., "Woodbourne," Knoll Road, Camberley.

Sussex.

Gray, N., 16, College Road, Eastbourne.
Humpherson, Mrs. W. V. Tanglewood, Kowfant, Three Bridges, Crawley.
Marsh, H. E., 1, Cantelupe Road, Bexhill.
Middleburgh, H., 44, Sackville Road, Hove.

Warwickshire.

Cale Matthews, G. F., 51, Newhall Street, Birmingham.
Day, A. J. W., 43a, Calthorpe Road, Five Ways Birmingham.
Hollick, R. L. B., 15, Calthorpe Road, Edgbaston, Birmingham, 15.
Matthews, T., 42, Sheep Street, Stratford-on-Avon.
Roe, S. H., 51, Calthorpe Road, Edgbaston, Birmingham, 15.

Worcestershire.

Strickland, J. N., Buckingham House, Graham Road, Great Malvern.

Yorkshire.

Sclare, Miss R., 36, Francis Street, Leeds, 7.
Shenton, F. C., 166, Ring Road, Halton, Leeds.
Tinn, C. A., School Medical Department, Northfields House, Halifax Road, Dewsbury.
Townend, B. R., 131, Manygates Lane, Sandal, Wakefield.
Wood, T. Jason, 6, Mornington Villas, Manningham, Bradford.

SCOTLAND.

Anderson, H. A., 4, Clifton Place, Sauchiehall Street, Glasgow C3.
Archibald, W. C., 125 Nethergate, Dundee.
Kemball, C. H., 20, Ainslie Place, Edinburgh, 3.
Logan, W. Russell, 5, Randolph Crescent, Edinburgh, 3.
Murray, J., 14, Albyn Place, Aberdeen.

IRELAND.

Dockrell, R. B., "Termon," Sandycove Avenue, W., Dun Laoghaire, Co. Dublin.
Fitzgerald, G. M., 5, Herbert Road, Ballsbridge, Dublin.
Flanagan, L. 29, Lower Baggot Street, Dublin.
Friel, S., 3, Fitzwilliam Place, Dublin.
Keith, J. E., 13, Upper Fitzwilliam Street, Dublin.
McKeag, H. T. A., Suite No. 142d, Scottish Provident Buildings, Donegall Square, W., Belfast.
Sterling, Mrs., 13, Upper Fitzwilliam Street, Dublin.

HONORARY MEMBERS.

Badcock, J. H., Bleak House, Mandiwell, Jamaica, B.W.I.
Brash, Prof. J. C., The University, Edinburgh, Scotland.
Campion, G.G., Inglegarth, Bramhall, Cheshire.
Keith, Sir A., "Buxton," Browne Farm, Downe, Kent.
Sim Wallace, J., 14, Church Grove, Hampton Wick, Middlesex.

CORRESPONDING MEMBERS.

Australia.

Adamson, K. T., 111, Collins Street, Melbourne.
Seward, J. T., 55, Collins Street, Melbourne.
Thornton Taylor, A., 175, Macquarie Street, Sydney.
Wilkinson, W. S., 145, Collins Street, Melbourne.

Egypt.

Salama, N., 127, Queen Nazli Avenue, Cairo.

Sweden.

Granerus, Dr. Ragnar, Stortorget, 1, Nassjo, Sweden.

India.

Brears, O. B., I.M.S., M.Z.26211, c/o Messrs. Grindlay & Co., Bankers, Bombay.
Ghosh, A. S., 54, Chowringhee, Calcutta.

U.S.A.

Gosman, S. D., 22, Northlaure, Street, Pridgeton, New Jersey, U.S.A.
Sillman, J. H., 667, Madison Avenue, New York City.

Africa.

Noriskin, J. N., 39, Jenner Chambers, 189, Jeppe Street, Johannesburg.

SERVICE SECTION

Names of members believed or known to be in the Services for the duration, arranged in alphabetical order. The Hon. Secretary has full details of rank and branch of service of those members whose names are marked with an asterisk. Service members whose subscriptions are in arrear and who wish to avail themselves of mailing facilities are advised to get in touch with the Hon. Treasurer.

*Archibald, H. M. D., 39, London Road, Reading.
Bane, B.
*Dagger, T., Parabola House, Cheltenham, Glos.
*Dimcock, J. R., "Redlingtons," Silver Street, Enfield, Middlesex.
Duncan, J. B.
Evans, H. R.
Gillies, A. R.
Headridge, W.
*Holland, N. W. A., 29-31, Abercorn Place, N.W.8.
*Holland, R. O., R.N.V.R.
Hovell, J. H.
Jones, D. Rhys.
*Leatherman, G. H., 35, Devonshire Place, London, W.1.
Morton, W. E.
Pain, A., 33, Earls Avenue, Folkestone.
Pook, R. S.
*Richards, H., c/o Barclays Bank, Southwark Branch, S.E.1.
*Steadman, B. St. J., c/o Mrs. Steadman, 3, Wavertree Road S.W.2.
Walther, D. P.
Williams, P. Lloyd.

Members serving in the Dominions or Allied Nations Expeditionary Forces.

*Franklin, Lt.-Col., 1414, Drummond Street, Montreal, Canada.
*Goldstein, Capt. M. C., U.S. Army Air Forces, 323, Bomb Group, A.P.O. 638.

Chewing as a Therapeutic Measure

By T. B. LAYTON, *D.S.O.*, M.S., F.R.C.S.

WHEN I accepted your invitation, Sir, to give this address, I did not know that it would be my last appearance in public as a specialist, which I ceased formally to be a fortnight ago, but it is very pleasing that it has so happened, because my first function as a specialist was to become the laryngological member of your Investigation Committee, in the year 1912, and the Chairman of that Investigation Committee was Mr. Harold Chapman. My most vivid memory of it is seeing Mr. Chapman sitting at the head of the table sucking his thumb and wondering what effect thumb-sucking had upon the development of the mouth of the newborn child.

I want to talk to you about chewing. I remember picking up the *British Medical Journal* when I was a student in the summer of 1904 and reading a letter from somebody, dealing with chewing. It was the fag end of one of those temporary waves that came across the country, started from America by a Mr. Fletcher, not a medical man. It was taken up enthusiastically by a number of people in this country, and I remember that in this letter human beings were divided into zomaphagists and trogophagists, gulping eaters and chewing eaters.

The late Professor Elliot Smith always insisted that man reached the position which he has attained in the animal world, because in the evolution of his central nervous system, he never specialised, and I think that this question of chewing illustrates Professor Elliot Smith's general principle. Man is neither a chewing eater nor a gulping eater ; he is a bit of both. He has never specialised either in the way that the dog has or in the way that the goat has. I think you should keep that idea in mind while we are considering what I have to say this evening.

I should first of all like to lay stress on the value and the importance of chewing in digestion. Stress was laid on that by Pavlov. The only monograph on physiology which I have read through from cover to cover is Pavlov's book on the work of the digestive glands, published in 1902. Starling took the work up and carried it a little further. It is wonderful how the work of one man branches out into totally and entirely different work over a period of time. It was a "snip" for the Intermediate M.B. Examination in July, 1903, and that was why I read it all the way through, and in some way or other it has remained part of my medical mind ever since. I think it is because of that, that I have always been interested in chewing.

At the present time I am particularly careful not to get into the state where, like Fletcher, I should look upon chewing as the most important of all the muscular activities of the body. I wish you to understand that I do not put it in that position.

There is no doubt that the appetite secretion, which is the forerunner of digestion, is continued by the action of the saliva. The longer you chew the more you get saliva mixed up with the food that you are swallowing. Saliva, after the appetite juice, is the finest stimulus of the gastric juice, and the gastric juice is the finest stimulus of the digestive juices of the small intestine. Therefore, after the appetite juice, the secretion of saliva is the most important factor in a good digestion. The secretion of saliva is intimately mixed up with

chewing. It is not that the chewing stimulates the saliva but that the two are associated, and the more you chew the more the saliva. As Pavlov says, chewing is a part of the act of eating. We do not often to-day think very much of the act of eating, a mechanism as complicated as any of the other mechanisms in the human body.

I want to point out one thing to you with regard to this. These matters where things in the mouth have an effect upon the alimentary canal were only worked out by Pavlov in so far as the secretions were concerned. There is still room for a consideration of the same things in so far as the muscular movements of the alimentary canal are concerned. When that consideration has been given it will be found, I believe, that the continued action of good healthy chewing has a valuable effect on the passage of food from one part of the alimentary canal to another, just as it has upon the secretion of healthy digestive juices.

I do not quite know how that work is going to be done, because all the work done on the movements of the alimentary canal by means of bismuth and barium must be taken with a considerably large grain of salt. That is a thing which I think the physiologists have forgotten in the work that they do. Whether you are a fundamentalist or an evolutionist, you can be quite certain that the human alimentary canal was not meant to deal with substances of that specific gravity.

When the physiologists find some other means of investigation or when they can find an opaque substance of the same specific gravity as the food we eat, the whole of the work on the movements of the alimentary canal will have to be done again. Surgeons know one experiment with regard to this. If they want to inhibit peristalsis they allow absolutely nothing to go down the œsophagus into the stomach. It is the treatment for acute appendicitis, when the patient is in a position where no surgeon can possibly take out the appendix. I am old enough to have treated patients in that way, one of them being a Russian emigrant boy whom I treated on the way between London and Buenos Aires, alternately praying (*a*) that he would get well and (*b*) that I should have an opportunity of operating on him on the chart table with the steward giving the anæsthetic, but I am now glad to say that I got him through without that.

If (as I am quite sure is the case) the passage of food into the stomach is the great stimulus for the movements of the alimentary canal, the slow passage of food into the stomach which results from chewing does and must play an important part in the movements of the alimentary canal and therefore again with regard to digestion.

The second thing I was going to talk to you about I shall not deal with, because you know so much more about it than I do. It is the way in which chewing is associated with cleanliness of the mouth. That is one of the prime factors in the health of the teeth in those people who have been started off by Nature with good healthy teeth. The only example that I would put before you is that fine race of men, the Highlanders. I believe I am right in saying that it is notorious that in their native country they have very bad teeth and that this is in part due to their living on food which does not need a large amount of chewing but which can rapidly be swallowed, namely, boiled potatoes and boiled oatmeal.

The chief thing that I want to talk about is the palate as the gateway of the carfax of the pharynx or as the guide at the alimentary and respiratory cross-roads, directing your food into your stomach and then allowing the air to follow into the lungs before you have another swallow. When you see a child with a diphtheritic paralysis bringing water and milk down its nose, it becomes obvious that the prevention

of food going the wrong way into the nasopharynx is the most important function of the soft palate.

When a function is obvious it is frequently forgotten that there are other secondary or subsidiary functions. In this case there are certainly at least two. One is the moistening of the posterior pharyngeal wall with the soft palate every time that you swallow, and that is an important factor in the hygiene of the mucous membrane of the nasopharynx. The other is the action that the soft palate thus has upon the eustachian tube and its influence in the prevention and the treatment of otitis media.

What are the factors that cause the soft palate to move ? I think there are three; one is chewing, another is talking and the third is laughing. I do not know which one causes the movements of the palate to occur most frequently, but, in addition to the frequency of the movements, the range or possibly the force of the movements is certainly a secondary factor. My own belief is that laughing is the most important physiological stimulus to the movement of the palate and after that comes talking, chewing being the third with regard to the frequency and the range of movement, but I suspect that good tough chewing is the first and the best with regard to the power in that movement.

Let us consider each one of those things separately. Mr. F. J. Stewart, the best rhinologist I ever knew, always impressed upon us at Guy's, as a matter of physiology of the nose, that Nature needed a certain surface of mucous membrane in the nose in proportion to the cross-section of the airway. He never gave any figures, because (1) it is not necessary, and (2) it is doubtful whether it is possible to estimate the surface of the mucous membrane of the nose and the area of the cross-section of the airway, but you can accept it as a principle for the whole of the upper respiratory tract that wherever that relationship is upset you are getting beyond the bounds of normality in a healthy upper respiratory tract, and there are two places where it becomes particularly important.

First, there are what Mechnikov calls the disharmonies of nature, barely pathological, but in rhinology very important. The nose is a part of the body where there are very few diseases but very many disharmonies, and, long before you get the disturbance between cross-section and surface, that is the underlying factor in all cases of atrophic rhinitis, you have evidence from the dryness of the mucous membrane in the nose.

The other place where you notice it is in the distance between the soft palate and the posterior pharyngeal wall. If the soft palate does not wipe the posterior pharyngeal wall efficiently you will have disharmonies of the naso-pharynx which cause a lot of distress to the patients, frequently described by them as catarrh, sometimes passing on to a degree where there is actual pain, so that it causes soreness of the throat. They complain of a sore throat. The treatment of the sore throat is to take out the tonsils ! After the tonsils are removed the patients are very much worse, as the result of impairment of the movement of the palate caused by the operation.

That is the first factor in the upper respiratory tract where chewing aids in keeping the upper respiratory tract in a healthy condition.

The other is the eustachian drainage. I have come to the conclusion that, whatever other treatment is used in the case of otitis media, the final decisive factor in curing it is to set up again eustachian drainage. It does not matter whether no operation has been done on the blind end of the middle ear cleft or whether a paren-

cetesis has been performed or whether a mastoid operation has been performed. It does not matter whether you call it eustachian inflammation, otitis media or mastoiditis, and it does not matter whether that mastoiditis is a simple mastoiditis or one associated with intracranial complications. The final recovery of the case, by which I mean a healed drum and a dry ear, depends upon the reconstitution of eustachian drainage.

Both spitting and chewing contribute to the treatment of otitis media. By spitting I mean the extrusion from the upper respiratory tract of masses of mucous secretion either by nose-blowing or by the "upper hoick." I always thought that in a polite society when it was necessary to refer to one of the more unpleasant physiological movements of the body it was the thing to receive it without a smile, but it is very often forgotten, and I find that students do not know enough about the series of complicated movements which result in the extrusion of foreign bodies from the upper alimentary and respiratory tracts. They know about coughing and they learn all about the complicated mechanism of vomiting, but when you ask them the difference between vomiting and retching you find they know nothing about it whatever.

Retching is the emptying of the œsophagus with the cardiac opening of the stomach not becoming patent, but when you come further up there are two hoicks, a lower hoick and an upper hoick. The lower hoick is for removing foreign bodies from the part of the pharynx which is below the oropharynx. The upper hoick is for removing foreign bodies from the nasopharynx, the mucous membrane covering the posterior pharyngeal wall and the mucous membrane on the upper surface of the soft palate. If you get the nasopharynx dry, with the secretion sticking to its wall, you have to go through a complicated series of muscular movements, which emit very unpleasant noises, before the secretion is got into the mouth and can be converted from phlegm into sputum by being spat out. It is an important factor in the physiology of the nasopharynx. If there is a healthy nasopharynx there is little or no need for hoicking except when somebody makes you laugh just as you are swallowing a bit of food.

But to return to the eustachian tube. I want to speak about the movements of the palate in relationship to the eustachian tube. The idea came to me from Wilfrid Trotter, the most wonderful man that the British medical profession has had since Lister. That is my opinion of him. Wilfrid Trotter described a method of treating epistaxis You sit the patient up with his head forwards, you put a dental prop in his mouth, give him a towel or a large plug of wool and tell him to say to himself "Now bleed," and his nose stops bleeding. It is infallible with everybody who will believe in it. Since I learned it from Wilfrid Trotter the only house surgeons who have not been successful are those that believe that I am a silly old fool and that there is not anything in it, and they want to be doing something, such as plugging the nose. I have replaced the dental prop by a cork, which is more ubiquitously obtainable and is a little more comfortable to the patient.

Wilfrid Trotter's argument was this. His idea was to inhibit swallowing and then to let the blood come out of the front of the nose. If it did that, the blood within the veins would not only clot but become adherent to the vessel wall. Every time blood got on to the upper surface of the soft palate the swallowing reflex was brought into action ; up went the soft palate ; down it came again. Just where the soft palate joins the lateral wall of the pharynx, just in front of the eustachian tube, just above and behind the back end of the middle terminal, is the spheno-palatine perineum, through which practically all the arteries and the whole of the blood supply come into the nose and through which the veins go back into the pterygoid plexus. When they are running across the nose those veins are lodged in grooves on

the terminals, and they therefore have a wall which is rigid on one side and quite mobile on the other. Every bit of tugging on that tugs on the clot and pulls it away again. Every time the soft palate goes up there is a momentary negative pressure in that nasopharynx as it begins to come down again, and there is that tug upon the vein. Believe it or not, that stops epistaxis. I say "believe it or not," but I really mean "believe it and try it."

Thinking this over, I realised that if there were that tug there was a similar tug on the opening of the eustachian tube, and then I got hold of a patient in whom we were able to see the movements of the pharynx from the front. He was an old man who acted as a door porter in the Commercial Docks and from whom Mr. Mollison thirteen years previously had excised the upper jaw. When this old man, who looked like a small John Silver with two legs, took the patch from his eye you saw right in through a big opening back to the posterior pharyngeal wall. You could see the soft palate come up with every bit of movement. You could see the eustachian tube turn round and open during the movements of the palate.

I have never been able absolutely to correlate the two movements. I do not know at which stage of the movement of the palate the eustachian tube is opened. I have not re-learned the details of all those attachments of the palate that I used to teach to the students at Guy's when I was Senior Demonstrator of Anatomy. But we all know that there are certain fascicules of the muscles of the palate that go up and are attached to different parts of the eustachian tube. Some of them can be attached to the membranous part, and, as they are attached to the membranous part, so there comes about an opening of the tube and a re-establishment of eustachian drainage and suction from the middle ear cleft down into the nasopharynx.

We used to make this old man chew a bit of biscuit or suck a lozenge, and we then got him to laugh and talk. Another way in which the same points can be studied is with a frontal mirror and a nasal speculum in people who have an excessive airway associated with atrophic rhinitis. In some of them the atrophy of the terminals is so marked that you can see the eustachian tube through the anterior nares and you can see all these movements going on, and you can get these people to go through their various paces. I think it is then that you notice that the most rapid movement of the soft palate is associated with laughter, but whether it is the rapidity of the soft palate movement or the force of it that has the greater effect on the eustachian tube I do not really know.

You will see, therefore, that I do not look upon chewing as the only thing, but I look upon it as one of the factors that start those movements of the pharynx which have beneficial results upon the hygiene of the upper respiratory tract and therapeutic results particularly upon the eustachian tube, and therefore are important in the treatment of inflammations of the middle ear cleft.

Let us try to put together one or two consequences of the thoughts that I have endeavoured to put before you. One is the effect of the care of the teeth on the health of the nation. It is when a Guy's man goes to another hospital that he realises how very fortunate he was when working at Guy's with its large dental school. Wherever else you go, it is not a question of sending patients to the dental department ; it is a question of wondering whether the dental department can possibly do any more work.

In order to get efficient care of the teeth of the nation, in my opinion we need a vastly increased dental profession of the ordinary general practitioner type. You are now evolving into the higher operative surgeons of the dental profession. I do not suggest that every man

caring for the teeth in Balham, in Streatham, in Epping and other such places should remove impacted wisdom teeth or operate upon dental cysts. I believe that just as in medicine it is most important to turn out men and women who can do good average ordinary work, so it is with dentistry. In order to get an increased dental profession of that type, you have to increase your dental schools. I doubt whether you can double dental schools to any particular extent. I may be putting views forward which are anathema to some of you. We are shortly setting up a National Health Service. Fortunately you have not got your names into the papers on it, and I hope that you are getting on with the job.

With regard to chewing, we all have ideas in our heads, and I preached to mothers for years not to give their children anything between meals. I said they should give their children breakfast, dinner, tea and a little supper when they went to bed, and that they should have absolutely nothing between, and that, if father took them out on Saturday to buy some sweets or gave them a penny for lollipops, mother should get hold of those sweets and ration them, giving the children one after a meal.

I have a little cottage in the country, and in the garden of that cottage there are a few apple trees. My daughter commandeered it in the first year of the war, and her little son began to toddle about, and her daughter learned to crawl just as the windfalls were coming down. They ate the windfalls, including the mud and the rotten parts, from the moment that they went out before breakfast until the moment that they were brought in to be washed and put to bed, and never in all my life have I known two children so fit. I have entirely changed my views with regard to the absolute wickedness of allowing children to have anything between meals.

Then there is the question of the breakfast food. All these things bought in packets are very good so long as they do not convert the child into a zomaphagist : in other words, I think they are wrong when they are saturated with milk. The child gets hold of them, puts them into its mouth, gives a gulp, and there is no chewing in the whole of that breakfast. What I tell the mothers is this : let the children have a drink of milk before they start and then let them eat their various kinds of shredded foods dry with a moistened mouth.

I have invented a food of my own which I believe is as good as any of the others and which I am thinking of putting on the market after the war as Dr. Layton's Chewing Food ! It consists of coarse ground oatmeal and crystalline brown sugar. It is not Demarara, but the other kind ; let us hope that it will not be long before you will be able to get it again. I experimented with this food on my granddaughter when she stayed with us, and my wife said to me : " Do you know that that child has eaten about double the amount of oatmeal that she would have eaten if it had been made into a plate of porridge ? " But even this food children are inclined to gulp, and I am not quite sure that they need such a moist mouth.

There is another mistake. My grandmother had the idea that if you drank before a meal it diluted the gastric juices and spoiled your digestion. When she came in the autumn to stay with my parents I, as the only grandson, sat next to her. I vividly remember coming back from school, getting up into my high chair and being just about to drink a good gulp of water when my grandmother took the glass away from me and put it aside and said : " No you don't, young man ; you will eat the whole of that helping of boiled peas, and so on, before you touch any of that water." I have not the slightest doubt that she was doing what she thought best for me, but I am quite sure that you need to moisten the mouth before you start eating any food that is of a dry nature.

Now let us come to a rather wider matter on this question of food. A child who is in the toddler stage and is just beginning to feed himself takes a lot of time. It needs a great deal of patience on the part of the person looking after him, and a considerable amount of food is usually spilt down between the table and the bib. But what distresses me is that he is always called naughty instead of being helped in his education in the complicated movements of getting his food up to his mouth.

When there is a large number of children gathered together it is almost certain that they will be provided with a food that is far too sloppy. I have particularly noticed this in those very excellent institutions, the fever hospitals of what was once the Metropolitan Asylums Board and is now the London County Council. They have a food for the children which, when the children are ill, is a very useful and good food, but as they begin to become convalescent they want to get away from slops on to some food that requires a considerable amount of chewing .

It is always the custom of each generation to think that the oncoming generations are not as good as they were, and one of those things with regard to myself is that it seems to me that children today are very loth to eat crusts. I remember that one of my cousins was notorious for eating up his slice of bread and butter and asking for another one, until his elder sister said, " No, you don't ; you have hidden your crusts under your plate," so I suppose children are not any worse in that respect today than they were when I was a small child. But the chewing of crusts is a very important thing.

Lastly do not let your children grow up to be too polite. My maiden aunts used to insist that I ate my food like a little gentleman. They gave me the crust that I always liked and which I think they could not eat, but they used to cut it up so that I could bite it off tidily instead of getting a good grip on it and biting it off. I am quite sure that it is a very healthy thing for children to get a good grip on a crust and eat it in that way.

I have no doubt that there are many other small points in the conduct of life and particularly in the bringing up of children that will come into your minds and that you will be able to develop the ideas that I have tried to put before you.

DISCUSSION

The President said that the members had listened to a very delightful and stimulating address, and he could not remember having spent a more interesting and entertaining Saturday afternoon for many years.

He would like to ask Mr. Layton whether in his opinion the constant use of chewing gum had a deleterious effect or otherwise.

Probably all the members had had experience of old charwomen who had lost all their teeth, which had just dropped out, but who went on eating for years the same meals as people who had sufficient teeth to enable them to chew their food before they swallowed it. He had in mind one such woman in particular who had been employed in his household for ten or fifteen years and had eaten exactly the same meals as the family. She had never had dentures and had died at the age of 75, remaining vigorous up to the end of her life.

Mr. R. E. Rix, in opening the discussion, said he now realised that chewing involved a much greater range of activity than he had imagined before listening to Mr. Layton's interesting address. He had hoped that Mr. Layton would touch upon some of his hobbyhorses, so that he could ask him questions upon them.

He noticed that there was no reference in the address to adenoids or adenoids facies and narrow upper arches. Comparatively recently

Mr. Layton had given a lecture on that subject at Guy's and had then said that there was no evidence to show that narrow upper arches and adenoid facies were associated with nasal obstruction, but he had also said there was some evidence that adenoid facies and narrow upper arches were found in people with adenoids. He would like to ask whether Mr. Layton had any opinion as to the reason for that association. He believed Mr. Layton had quoted Sir Arthur Keith as saying that perhaps adenoids and narrow upper arches were secondary to some constituent in town life.

Mr. Layton had not mentioned the effects of function on bone growth, but he would like to make a few points on that subject. The theory that lack of function prevented people from obtaining enough room in their arches for good alignment of all the teeth was a very attractive one. Sim Wallace was the great proponent of that idea and postulated a hereditary stimulus to bone growth to which was added after birth a functional trophic stimulus. The idea was so reasonable that it seemed to him disarming. All the members had seen boys whose lusty appetites and boundless energy had been an assurance of good musculature, yet there was not always enough room in their dental arches for their teeth to be in good alignment, and he would not have considered it feasible to suppose that anything had lessened their power of mastication or that their muscles of mastication did not work frequently enough.

In that connection he thought it was even more difficult to agree with Rogers, who believed that certain muscles amongst the whole group of masticatory muscles were weak, and asserted that weakness of the pterygoids was frequently responsible for the distal position of the mandible in relation to the maxilla. He knew of no parallel conditions in other parts of the body. Frankly he did not think that it was simply lack of strength or lack of exercise that gave rise to most of the dental troubles in which this Society is interested.

He thought it was necessary to use care in the matter of terminology. In talking about a lack of function one should be careful not to confuse such things as abnormal extraneous forces, abnormal forces which might be a by-product of an aberration of normal function, muscular weakness and infrequency of effort. If people did not say exactly what they meant in discussing the subject they would be talking at cross purposes.

He had been interested in what Mr. Layton had said about the upper hoick. It seemed to him that it might be a valuable thing to teach children occasionally.

He wished to thank Mr. Layton very much for his interesting paternal talk and to say how much the Society appreciated his attending the meeting, having regard to the fact that within a few weeks he would be leaving this country to take up his appointment as Director of Medical Supplies in Sicily under U.N.R.R.A.

Mr. R. Cutler said that Mr. Layton's voice came to him like an echo of the distant past, and, as an old Guy's student, he felt he might have priority in speaking now. In days gone by Mr. Layton had a great reputation for directing shafts of caustic wit at his students, with the result that those who are sensitive avoided his company, although it was very difficult to get out of earshot of him. He himself had learned sense since those days and was now one of Mr. Layton's most devoted adherents, and he regretted that he had never been one of his dresses. He had read Mr. Layton's communications on all sorts of subjects in *Guy's Hospital Gazette*. His address on the present occasion had been magnificent.

Mr. Layton had begun his address by referring to the cleanliness of the mouth and its mechanical efficiency and to the appetite juice, and he had then gone on to talk about the use of the saliva. He had been

afraid that Mr. Layton was going to " debunk " orthodontics generally, and he had been pleased to find that, on the contrary, Mr. Layton had encouraged orthodontists.

Whenever he was confronted with a severe Class II, division 1 case he always thought of the analogy between the mouth as a mechanical unit and a car locked in second gear or a car with a very restricted steering lock. It was an inefficient mechanism for the purpose of mastication, and he felt when he started treatment that it was not only for the æsthetic results which might accrue but also for the benefits that might accrue in the conversion of a grossly inefficient biting mechanism into something that was reasonably useful. A vicious circle was set up in the case of a child who had a severe Class II, division 1 abnormality, because that child must find chewing very difficult indeed.

He would be interested to hear whether Mr. Layton had any evidence with regard to the factors that made for cleanliness in the mouth. He was most interested in studying a group of any given twelve patients, whether they were adults or children. One assumed that they all cleaned their teeth in much the same manner, yet some adults and some children had perfectly clean mouths, almost like a cat's mouth, whereas others had starchy food clinging all round their teeth, and that was reflected upon the condition of the appliances they wore, whether they were orthodontic appliances or dentures. In one patient the dentures or appliances was quite clean, whereas in the case of another patient, who, so far as one knew, had quite reasonable sanitary habits, the teeth and the appliance or dentures were covered with starchy carbohydrate slime. He wondered to what extent the appetite juice or the act of chewing might have helped the cleaning process.

He would like to express his deep admiration of Mr. Layton's work in many spheres outside his own particular one and to repeat that he had been completely converted to Mr. Layton's theories.

Mrs. Michaelis said she felt it was time that someone who had not gone to Guy's and was not at all ashamed of that fact should put in a word for the rest of the profession. She was always a little amused when she heard people from Guy's insisting on the necessity for a numerical enlargement of the dental profession, having regard to the fact that women were not accepted as students at Guy's.

She wished to thank Mr. Layton very much for an extremely interesting and amusing address. She could not resist the temptation to suggest that Mr. Layton might have had something to do with the composition of the current popular song " Have you got any gum, chum ? "

There was only one question that she wanted to ask, and that was whether Mr. Layton could suggest any cure for the child who could not be made to chew, whatever its parents did, and whose parents sometimes in sheer exasperation punished it, as Mr. Layton had said, quite wrongly. If Mr. Layton could give any practical solution for that problem she would be very glad to hear it.

Mr. A. G. Taylor said it certainly was not Mr. Layton's fault that there were no women student's at Guy's.

The gist of Mr. Layton's address had been that good mastication, amongst other things, was essential for the health of the middle ear, and he had also indicated that good mastication might be necessary for the health of the stomach.

In the course of his own work he had the opportunity of seeing all the patients admitted to a large general hospital and he had collected a large number of figures in the case of those who were suffering from gastric ulcer. Students were always taught that one of the main problems of dentistry as applied to medicine was that of oral sepsis, either obvious, such as pyorrhoea, or hidden, such as gum granulamatous

conditions, but it appeared to him that that was not quite true of the gastric ulcer cases. He had formed the opinion that the way in which those cases differed from the bulk of the members of the same age groups was that they had not a very efficient masticatory apparatus. Very large numbers of them were short of teeth or had no teeth at all or had inefficient dentures. That was his own little hobbyhorse, and he could now spur it on with the knowledge that he had the agreement of Mr. Layton that efficient mastication was also helpful in maintaining the ear and the nasopharynx in a good healthy condition. It was obvious, then, that in order to have efficient mastication people must have all their teeth or as many teeth as possible in good functional position, and that, he thought, was where Mr. Layton encouraged the orthodontist.

Mr. Layton had also raised the question of how, if a child had sound functional dentition, one could ensure that it was set to work, that was to say, how one could get the child to use its teeth in a really efficient manner. According to Dr. Sim Wallace, the chewing of good hard food was the prime necessity for keeping the teeth in a clean and healthy condition, and he agreed with that view. A very large number of children nowadays had meals in school. Mr. Layton had referred to the meals which children were given in hospitals, and the meals given in schools, British restaurants and public assistance institutions were very much the same. They consisted usually of stew, and no really good hard fibrous food was given to the children, on which they could try out their teeth and so keep the rest of their bodies reasonably healthy. The reason was that a large amount of the cooking was done in bulk, there being only a limited number of people to prepare the food. They cut up the meat and vegetables and put them into a big stewpan, and the children in schools, the patrons of British restaurants and the poor old men and women in public assistance institutions and the like got nothing but soft food, which they simply had to gulp down ; there was nothing for them to chew at all. Even nowadays, when advertisements were put in the papers to teach people the proper way of cooking cabbage, i.e., cooking it in a very little water and in a very short time, thus economising in gas and at the same time retaining the vitamins, that type of cooking was impossible in the kitchens that supplied the institutions to which he had referred. The real difficulty lay in getting the great public bodies concerned to provide people with well-cooked food that needed masticating. It was unfortunate that Mr. Layton was going to Sicily and not remaining in this country, where he could use his influence in trying to save the teeth of the people.

Mr. N. Gray said he wished to thank Mr. Layton for his paternal, amusing and interesting address, which had drawn attention to a field very close to that of orthodontics and to factors which were operating all the time on their own specialised field, though orthodontists might be unconscious of them.

It was true, as Mr. Layton had said, that chewing was not the most important exercise of the body. There were many functions and exercises of the body which were infinitely more important, but chewing was one of the vital functions of life, and he thought orthodontists were inclined to overlook some of the things that were associated with it. Mr. Layton had drawn attention to the lavage and lubrication of the nasopharynx and to the upper and nether hoick rather than the upper and nether millstone of the teeth. It seemed to him that chewing was not the most important factor. It was a very important one, but there was great importance in the nasopharynx. Mr. Layton had said that there were disharmonies which were not pathological. All orthodontists had met children who had disharmonies of the dentition and occlusion which were not pathological, but it seemed to him that they might be associated with the nasopharynx.

He would have liked Mr. Layton to say more about the association of chewing with oral hygiene. Mr. Rix had pointed out that some mouths were perfectly clean, like the mouth of an animal, and that others were not. A specialist had come to him and he had begun to scale his teeth ; it was the first time he had had it done, and now he had to come for it every month ; it seemed to be essential for him to have that oral hygiene. Previously he had been on a diet which provided a normal cleansing, and, although there was tartar then, there was nothing like the tartar that there was to-day. He felt there was some factor in oral hygiene about which enough was not known ; he did not know whether it was the saliva or what it was.

He thought it had done all the members good to hear another field discussed, and it had widened their own field.

Mrs. Lindsay said that she owed a special debt of gratitude to Mr. Layton for accepting the invitation to address the Society. He reminded her of a Dr. Boyd of Edinburgh, who gave a very dramatic illustration of the effect of chewing ; he gave a meal of mince to a man, and it was seen in a radiograph lying at the bottom of his stomach and not moving ; then he gave the man something very tough to chew, and the peristalsis movements began. Dr. Layton also reminded her of Mr. Breese's experiments on some school children. He went to the school just after a meal and ordered the children to be sent straight from the table to him. It was a Jewish school and the children had been eating the Passover bread, which was very sticky. Mr. Breese found that the children who had very good mouths and were healthy children had no bread adhering to their teeth, whereas the others had their mouths full of the sticky material. She agreed with Mr. Gray that there must be something in the mouth which made it self-cleansing and which was not fully understood yet.

Mr. L. Levien said that his own child had started as a very bad chewer. His wife used to bake bread in the oven and make it into rusks, which the child was told she must eat. For quite a long time she would not do so, but the plate of rusks was put on the table at each meal and she was told that she must sit at the table until she had eaten some. After some weeks she became quite fond of the rusks and used to ask as soon as she came to the table : " Where are my crusties ? " She finally became an excellent chewer and developed a splendid set of teeth.

Mr. H. Chapman said that at the London Hospital clinic he came across children whose habits of general cleanliness and brushing of teeth were probably no different from those of other children but who had wonderfully healthy mouths, and he agreed that there must be some natural factor involved which was not yet known. It did not seem possible to convert the other type of child into that type, but if the solution of the problem could be found he was sure that much progress would be made towards preventing dental caries.

Mr. Layton, like himself, did not preach orthodoxy for the sake of orthodoxy, and he was very glad to hear Mr. Layton say that certain statements must be taken with a grain of salt. Personally he always tried to impress upon his students that they must not accept everything they read without question but must try to find out whether there was a good reason for the statements which were made. He was also glad that Mr. Layton had the courage to say that he did not know.

With regard to not drinking before meals, would not the argument used in that connection apply also to drinking after meals, so far as the gastric juice was concerned ? His own custom was to drink at the end of a meal and not at the beginning at all. He sometimes moistened his mouth in the middle of a meal.

He would like to hear Mr. Layton's views on chewing being a preventative of colds.

Apropos of Mr. Cutler's remarks, a number of parents had told him when he had corrected Class II, division 1 cases that the children's tendency to colds was considerably less.

Mr. J. F. Pilbeam said he would like to ask Mr. Layton a question with regard to breathing. He had recently heard a teacher telling a class of children that they should breathe in through the nose and out through the mouth. He had asked her who had given her the instructions for that exercise, and she said they were in the Board of Education exercises in physical training. He had spoken to an eminent ear, nose and throat surgeon on the subject and he agreed that such breathing was entirely wrong, that both inspiration and expiration should be through the nose. He would like to have Mr. Layton's views on that subject.

Mr. Layton, in replying to the discussion, said he was not at all sure that the same movement was performed in the chewing of chewing-gum as was performed when good tough food was chewed.

With regard to the edentulous persons to whom the President had referred, the way they managed to eat ordinary food was wonderful. Young dental surgeons and young throat surgeons tried to insist upon elderly people having their last two teeth taken out because they did not meet, but those people managed wonderfully well.

He knew of only one absolute indication for tonsillectomy; that was in the case of the woman aged 40 who looked 28 or 30 and who was married and had a husband about whom she had to be very careful; she got a pain somewhere and an enthusiastic physician demanded the excision of the focus of sepsis; she had a complete set of perfect teeth. In order to retain those teeth, so that she could save herself from being made to look 50 and so that she could retain her husband, he was always willing to take her tonsils out.

Mr. Rix surely could not expect him to be riding the same hobby-horses as he had been riding when Mr. Rix was his dresser in 1927. They were all in the stable, fit and healthy and ready to come out if need be, but he must have a new one sometimes. He would ask Mr. Chapman and others who had studied at Guy's: "Who can be orthodox when he has worked under Lane?" Lane taught him that if there was ever anything in surgery upon which everybody was in complete agreement it was quite certain that that thing was wrong, and he believed that to be true.

With regard to the development of the palate and the face, Lane used to describe rickets as an increased preparation for and a diminished completion of bone formation. Clinical rickets was not seen to-day, but he sometimes wondered whether some of the not quite sufficiently developed bones which got distorted might not be regarded as a minor degree of rickets. Lane said that the bones were the crystallisation of the lines of force. Osseous tissue was laid down in pillars along lines or planes through which force was habitually being driven in the various movements of the body. He thought Mr. Rix was wrong in discarding a theory because he could not find a parallel case in some other part of the body. The fact was that the development of the bones of the face was a far more complicated problem than the development of the bones in any other part of the body. There were more factors concerned in it. There was the question of the current of air going through and preventing the palate from going up.

In spite of the fact that he had opposed Lane on it and had opposed other people ever since on it, he could not get away from the feeling that there was some association between the high arched palate and nasal obstruction. He would like a dental surgeon to take a cast of the palate of a person with a congenital obstruction at the back end of the nose, who had never breathed through his nose, because if that palate was perfect he did not see that there could be any connection between the obstruction to nasal breathing and the deformity, unless, as he

suspected, the common cause of obstruction of nasal breathing, namely, the increased mass of lymphoid tissue in the nasopharynx known as adenoids, was dependent upon the same factor as that which twisted the teeth. But he would not talk about adenoids, because they did not exist. They had disappeared just like green sickness. The young people who scratched nasal pharynges either were scraping away normal masses of lymphoid tissue that had better be left alone or had got hold of some pathological condition which was totally different from the one that used to exist when he was a student.

He was by no means thinking of "debunking" orthodontics. He wanted to point out the wide range of orthodontists' work, which extended from the far end of the middle ear cleft down to the end of the alimentary canal.

Mrs. Michaelis had referred to the fact that women students were not taken at Guy's. He had been trying to persuade Guy's to take women for the last ten years, but without success. On the last occasion when the matter was raised it had been opposed by all the junior dental surgeons; he thought the proposal would have been carried if they had not come and voted against it.

With regard to the question of the child who would not chew, it was very difficult to get a child to adopt good habits of that kind. It was a negativism on the part of the child. He would advise Mrs. Michaelis to get Charles Cameron's little book, "The Nervous Child," which had been published just after the last war. It was one of the really great books on clinical medicine. He did not say that Mrs. Michaelis would get any exact instructions from it.

The method described by Mr. Levien for getting a child to eat food that needed chewing was one which he had preached to mothers, telling them that if the child would not eat the food that was set before him at one meal the same food should be brought back at succeeding meals, and sooner or later the child would eat it. He did not agree with that now, and he did not think it worked. Children would apparently go on starving for weeks and then suddenly they would start gobbling up their food. The course to take was to pretend that one did not care twopence whether the child ate his food or not, and then he would start eating it out of sheer negativism.

With regard to the breathing exercises to which Mr. Pilbeam had referred, the children at Guy's who were taught to do breathing exercises were told to breathe in and out through the nose. Then the London County Council started physical exercises as part of the children's education, and the children were taught to breathe in through the nose and out through the mouth. He did not think it mattered which they did. So far as he could see, the primary physiological way of breathing was to breathe in through the nose and out through the nose, but the moment one started to take hard physical exercise one had to open the mouth or one could not get a sufficient respiratory exchange of oxygen, and then one breathed out through the nose and the mouth. It was physiological to breathe in through the nose and out through the mouth, and he did not think it was not physiological to breathe in and out through the mouth. The rhinologist laid far too much stress upon the absolute necessity of getting nasal respiration.

With regard to the common cold, he would not say anything about that on the present occasion. It came essentially within the sphere of the general practitioner and not the sphere of the specialist. He had written an article on it for the *Practitioner*, and he believed it would be published in the February issue. He was rather pleased at being asked to write it when he had ceased to be a specialist, because he had been able to discuss matters which some people would say had not anything to do with the common cold.

On the motion of **The President,** a vote of thanks was accorded with acclamation to Mr. Layton.

OUR OPPORTUNITY

By NORMAN GRAY, H.D.D.(Edin.), L.D.S.(L'pool.).

Presidential Address.

I suppose that the new President of such a Society as this is expected to give some account of how he has secured this signal honour. If such is expected of me, I can only say at once that I have neither the nerve nor the pretention to say anything of the kind, but I am very sensible of the honour you have done me, and only hope, with your support, that I can be half as useful as some of my distinguished predecessors.

The suggestions that I have to make, I would make from the pit and the arena rather than from the pulpit or platform. Such authority and interest as these remarks may possess will be derived from the good fortune that has enabled me to make an exhaustive post-graduate course with leading orthodontists in America some ten years before the war, and from the recent privilege of serving on an Education Committee appointed by the Council of this Society to consider the teaching of orthodontics to undergraduates in the post-war period. Thus a magnificent opportunity has been afforded of viewing the field of orthodontics from many angles, during the eventful period conditioned by the intersecting shadows of the two greatest wars in human history.

How staggering are the contrasts with which this generation is faced! Never in living memory has brute force held such sway; never has such destruction and desolation been contemplated; never such break-up of home-life, such movement of child population. Liberty in vast areas destroyed, justice travestied. Something very like the dread Horsemen of the Apocalypse has once again been abroad in our world, and made it very sick and very weary.

On the other hand, there is the startling contrast of a great and growing body of idealists who look upon this sickness and weariness as a God-given opportunity for reconstruction on an unimagined scale. In spite of the world's brutalities, perhaps because of them, old and young are thinking more than ever of a New Jerusalem, not only in England's green and pleasant land, but within the wider horizon of recently occupied Europe.

The importance of scientific knowledge and investigation in every sphere of physical welfare was never greater than today. As the medical correspondent of *The Times* pointed out recently (*a*), the medical care of the child in sickness and health is now entering upon a new and most important phase closely concerned with the welfare of the nation as a whole. Departments of Child Health have been opened in Edinburgh, where a University Department in Child Life and Health dates from 1931. The Nuffield Provincial Hospitals Trust has recently made a grant for research in infant problems. In Newcastle-on-Tyne a Department of Child Health of the University of Durham has been open since 1943, and a similar one at the University of Liverpool was opened in October, 1944.

I venture to suggest that this Society, which regards the welfare of the rising generation as its special field, will shortly be called upon to play a more active part in the care of the national health and life, since the Empire is pledged to take a leading part in the swiftly changing social and economic structure of tomorrow. As orthodontists, are we ready to meet this call? Are we qualified to take our share in the preventive services for children? When indicated, orthodontic care is a basic necessity to the physical welfare and social adjustment of the child. Are the dental schools qualified to turn out an adequate supply of trained orthodontists to serve these new child health

centres that will spring up all over the country? My carefully considered answer is most emphatically "No." We are not even able to provide enough orthodontists for the existing school dental service. I quote the special report on orthodontic treatment of elementary school children: (*b*) "The number of new entrants each year into the schools of England and Wales is approximately 500,000, of which it has been estimated some 25,000 need orthodontic treatment. The maximum number of new cases which could be started by one whole-time orthodontist in one year is 250. Thus we estimate that one hundred orthodontists would be needed for a comprehensive school orthodontic service. At present there are only three orthodontists employed on a part-time basis in the school service." It has been shown quite conclusively that the employment of orthodontic specialists by the London County Council has resulted in a greatly improved service by making it possible for a far larger number of children to be more efficiently and systematically treated than was formerly the case. This immediately raises the old question of specialisation, upon which opinion is so very divided. May I illustrate by quoting from two presidential addresses. In 1935 Mr. A. C. Packham said: (*c*) "The age of specialisation has not yet arrived in this country . . . the fact remains that the average man must be prepared to undertake orthodontic work or anticipate losing some general practice as well." Contrast this with Mr. Maxwell Stephens as far back as 1928, who states: (*d*) "It is important for us to realise that a demand for specialists is arising from outside the profession. It is coming from our patients, who, after all, are part of the public." Now, in 1945, I should like to maintain from this chair that the time *has* come, if not for those committed to old practices, at least for the newcomers to our ranks, including some at present in the forces.

This war is our golden opportunity. This is our chance to put our house in order by laying the post-war foundation solidly now—the foundation of a well-planned undergraduate education, supported by a post-graduate school of orthodontics, to build up steadily an efficient orthodontic service for the school dental service and the new child health centres, and to extend this service to meet the demand that will sooner or later come from the lower income groups of the community.

Earl Baldwin once comforted a political colleague, struggling with the complexities of a constitution unwilling to listen to his reforms, by telling of an old lady who went down to Harrow to discuss with the headmaster the progress of her grandson. Being deaf she took with her an ear-trumpet, which she put up to her ear whenever she was describing the virtues of her grandson, and took down as soon as the headmaster began to reply. Insight carries with it the virtue of listening, a virtue that the great of the earth tend to lose as their importance expands; a virtue not always possessed by the education authorities of our dental schools when orthodontic reforms are put before them.

As I have mentioned before, the need for radical reforms has been brought before me very forcibly through serving on the committee of this Society, formed to make proposals on the teaching of orthodontics to undergraduates. From the teaching of students we were led on to the provision of treatment for elementary school children, and from that, because we discovered a serious shortage of properly trained orthodontists, we thought it essential to propose a scheme for the provision of post-graduate teaching.

For some eighteen months the committee met almost monthly for whole-day sessions to consider the entire question of the teaching of orthodontics, and our report was sent to all the universities and colleges in Great Britain and Ireland which have a dental school or grant a

dental degree or diploma, and comments were invited. As a result one important fact gradually emerged.

With notable exceptions, the general standard of orthodontic teaching throughout the country is not a very high one. One reason for this unfortunate state of affairs may be because orthodontic education has always been a difficult problem for the dental schools, as there are comparatively few teachers of orthodontics with specialised qualifications or standing. The length of time allocated to teaching orthodontics to students is often extremely limited, and there is not always an orthodontic examination for the L.D.S., consequently few students give the subject much consideration. And this low standard of education persists when a graduate goes into practice, because there is practically no post-graduate teaching to be obtained in this country. Those graduates who look for something to supplement their undergraduate training look in vain, unless they go abroad, or take an assistantship with an orthodontist. The result is that the great majority of dental practitioners have little time for orthodontic treatment, perhaps because they have little aptitude or inclination for the subject, but more likely because they have had little education in the subject.

Professor Friel once remarked that orthodontics and dental surgery have not a great deal in common. This may sound a very startling statement, but think of the hundreds of practitioners who never touch orthodontic treatment and yet get on very well with child patients. Orthodontics deals with *growth* problems of bone and muscle tissue as they affect occlusion of the teeth, whereas dental surgery is chiefly concerned with *diseases* of the teeth and gums. It seems to be obvious, therefore that radical changes in orthodontic education are long overdue, and a much more thorough training should be instituted to train recruits to meet the growing appreciation of the need of the child population.

Since the universities say that the undergraduate curriculum is already dangerously overloaded, and the time devoted to orthodontics is inclined to be reduced rather than extended, I should like this Society to urge the teaching bodies to adopt the model scheme of orthodontic education offered by the Majority Report of our B.S.S.O. Education Committee. This scheme has been circulated to the members of this Society, and submitted to all the teaching centres.

The Majority Report stresses the committee's conviction that it is a waste of time teaching orthodontic *treatment* to nine-tenths of the students who have no interest in the subject, and never expect or intend to have anything to do with it, much as the majority of medical students do not intend to practise ophthalmology. At the same time, the whole committee felt it to be essential that *all* dental students should be taught :

To recognise the stages of the normal development of the dentition from the child to the adult.

To recognise the early stages of developing mal-occlusion that require specialised treatment, as distinct from the type of case that is merely delayed development.

To advise parents on the orthodontic needs of their children.

To recognise the pernicious effects on the occlusion of needless tooth removal.

To recognise the type of mal-occlusion where the removal of a tooth or teeth from the arch will give a good functional and aesthetic result.

In other words, to enable the average dental surgeon to have an intelligent outlook on harmonious occlusion in his conservative work, in his prosthetics, and in all stages of dental treatment. This intelligent outlook on harmonious occlusion is not nearly so common as it should be. It has been one of my war-time privileges to examine and treat

many scores of school children at a dental clinic. When I first went to the clinic I hoped to do a good deal of orthodontics as well. I hoped it would be virtue's reward for undertaking a task for which no one else had time or interest. Imagine my disappointment on looking through all the old records to find only three " regulation cases," and to be told by the dental attendant that very few children ever needed this treatment as the parents rarely asked for it ! However, almost the first child I saw was an advanced post-normal occlusion, and from that day forward a session rarely passed without a new orthodontic case being added to my list, until finally the M.O.H. asked if I would undertake the orthodontic treatment exclusively as soon as a substitute could be found for the conservative and surgical treatment. The work was there all right, much more than I can handle ; it needed an interested observer. What I have described is, I believe, a very average state of affairs all over the country. The conservative treatment is very good and the acceptance rate for treatment is high, but I am afraid the average practitioner is just not interested in this more wonderful field of child-welfare. He rarely notices a developing mal-occlusion until well advanced, simply because he was never trained as a student to understand intelligently the stages of the developing dentition. To such orthodontics is merely complicated apparatus and his early training forces him to think only along the line of plates and bands. Causation of mal-occlusion, growth principles and development are beyond his scope, and so a true diagnosis of the oral and facial condition is lost, with dire results for countless unfortunate patients. As Salzmann says in a very recent publication : (*e*) " The dentist is not rendering a complete preventice service when he ignores the development of the occlusion of his child patients. The service which the dentist usually considers of a preventive nature is generally nothing more than the early treatment of morbid dental structures. By basing his approach to the child on the establishment and maintenance of proper dental occlusion and dentofacial development, by forestalling and checking developing abnormalities, not only of the teeth but also of the face and jaw, the dentist has the opportunity to practise prevention in the literal sense of the word."

In order to train a wider outlook, the model scheme for undergraduate education in orthodontics has been submitted to this Society. This scheme has been divided into two parts. Part I to be a compulsory course taken by all students and to cover the full range of lectures, but not to teach technique. Part II to be an optional course on orthodontic treatment and technique taken later by the keener student who may have a natural inclination for orthodontics in his practice, or who later on may go to the proposed post-graduate school.

As the report of the committee points out, the first step in the preparation of a comprehensive scheme of orthodontic education is the provision of post-graduate facilities. One's first thought here is an elaboration of the existing orthodontic training in dental schools generally, but a moment's consideration will immediately show how impossible this would be, the dispersal of effort would be too great in view of the shortage of teachers and the limited number of graduated students interested.

A concentration of effort in one special centre connected with a dental hospital and a university would be a very different matter, however. This would enable satisfactory courses of an extremely high standard to be commenced at a relativley early date after the cessation of hostilities. By this method it is estimated that some eighteen students could be trained annually.

Here the graduate student would undergo a very comprehensive year of whole-time instruction and a diploma would be granted by examination. This would ensure that the qualification of the ortho-

dontist of the future would be of a definite standard, both for the practitioners and teachers in the schools.

Dr. F. B. Noyes of Chicago, in an article entitled " Post-War Problems in Orthodontia," says : (*f*) " The problem of providing and arranging such post-war education and training is not easy and will require careful consideration and study on the part of institutions and educators. Unless they are planned and arranged for before the time comes, there is little probability that satisfactory programs will be worked out on the spur of the moment."

As a member of the British Education Committee, and knowing something of the immense amount of work that has been put into the syllabus we have presented to you, I feel a great deal of the spade work on post-war education has been done by men of authority in the teaching world, such as Friel, Chapman and Rix, through the B.S.S.O. here in London. I think we can proudly say that it has been done quite as thoroughly and efficiently as by its counterpart in America. It now rests with the members of the Society to see that this work is not shelved indefinitely, or turned down half read by some of the dental schools, or merely used by other countries in their post-war planning. Let us avail ourselves of the opportunity for reconstruction created by this destructive war.

The Editorial of the September number of the *Journal of the American Dental Association* says : (*g*) " Among the many obligations that those who have not been called into service will owe to those who entered the service will be to provide ample facilities for post-graduate work and educational refresher courses." Referring back to the earlier article, Dr. Noyes continues : (*h*) " The men who went into the service directly after graduation from professional schools will need a different kind of professional education and training before they will be fit for civilian practice. If they are going back into general practice, they will require an extensive refresher course with an opportunity for regaining lost skill. If they decide to go into a specialty, such as orthodontia, and probably some of them will so decide, they will need a thorough course of training in the specialty, which they have never had. This must include both its scientific fundamentals and the development of technical skill and clinical practice. Such a program will require at least a year."

In view of the Government promise to make higher education in its widest sense available to ex-servicemen and women, and in view of the complexity of the needs of men returning from the three services, it is fundamental that really up-to-date post-graduate education should be available. No doubt many younger dental surgeons when released from war service will turn their thoughts to the school dental service, and no doubt a few civilian practitioners will do so too, especially those forced to replan their lives after evacuation or enemy action. To such, orthodontic specialisation might become a very attractive field, if only they could find an efficient post-graduate training.

The financing of a post-graduate school of orthodontics may appear to be beyond the resources considered available. Our committee spent a good deal of time on this question of cost. It was estimated that the annual expense would be £6,000. You will find the details are set out in the report. That figure would put orthodontics on a sound foundation in this country, and at the same time provide us with the finest post-graduate school of orthodontics in Europe.

As the whole plan is in effect a public health measure, some subsidy from the Government through the Ministry of Health should be forthcoming. Fees from students would form a useful contribution, but I think if this Society could be thoroughly roused it could do a great deal through its varied contacts with the medical profession and influential lay public, to ensure that orthodontics gets adequate

representation in an integral part of preventive medicine in child-welfare.

Then we should be entitled to some share of funds available for reconstruction under the Four Freedoms. Invested in post-graduate education such as I have outlined, I believe with all my heart that more would be done for orthodontics in five years than in the whole existence of this Society.

BIBLIOGRAPHY

(*a*) See *The Times*, October 27th, 1944, "Medical Care of Children."
(*b*) Report of the Committee appointed by the Council of the B.S.S.O. to consider the orthodontic treatment of elementary school children, 1944.
(*c*) *B.S.S.O. Transactions*, Presidential Address, 1935.
(*d*) *B.S.S.O. Transactions*, Presidential Address, 1928.
(*e*) Salzmann's "Principles of Orthodontics," page 2.
(*f*) F. B. Noyes of Chicago in the *Journal of the American Dental Association*, October 1944, page 1355.
(*g*) Editorial of the *Journal of the American Dental Association*, September 1944.
(*h*) F. B. Noyes, as above.

Mr. Robert Cutler said that, as a non-member of the Education Committee, to whose work the President had drawn attention, he would like to place on record his own appreciation of the tremendous amount of work which that committee and all its members had done. They had met, to his knowledge and as the President had said, for days on end, and he felt that the results of their work should not be overlooked. It was very easy for people to say how things should be done, but it was less easy to get people to sit down round the table and try to thrash things out. Mr. J. B. Priestley, for instance, was very fond of putting on record his ideas about how the politics of the country should be conducted, but, unlike Mr. A. P. Herbert, he did not go into Parliament and do his best at the Government round table. The members of the Education Committee had devoted an immense amount of time to the work of the committee, and any member of the Society who had not yet read the committee's report should do so.

Secondly, he would like to put on record his appreciation of the excellence of the President's address and to tell the meeting, from his personal knowledge, what an excellent general practitioner and orthodontist the President was in his own part of the world. It would be a very great advantage if there were men of his calibre and skill in the various places where children were congregated throughout the country. Unfortunately that was not the case, and the points to which the President had drawn attention in his address had therefore all the more significance.

He was sure that everyone present would join with him in thanking the President for his excellent address and in wishing him a very successful year of office. (Applause.)

The Report of the Special Committee appointed by the Council of the Society to consider the orthodontic treatment of elementary school children and post-graduate orthodontic teaching

J. F. Pilbeam, L.D.S.Eng., *Chairman;* Senior Dental Officer, Middlesex County Council.

Harold Chapman, L.D.S.Eng., Hon. Dental Surgeon, London Hospital; Examiner in Orthodontics, University of London; Lecturer on Orthodontics, London Hospital Dental School.

Sheldon Friel, B.A., M.Dent.Sc., Sc.D.Dublin, Professor of Orthodontics, Trinity College, Dublin; Examiner in Orthodontics, University of Dublin and Queen's University, Belfast.

Norman Gray, H.D.D.Edin., L.D.S.Liv., Hon.Dental Surgeon, Princess Alice Memorial Hospital; Dental Surgeon, St. Mary's Hospital, Eastbourne.

Ernest Rix, M.R.C.S.Eng., L.R.C.P.Lond., L.D.S.Eng., Assistant Dental Surgeon, Children's Dept., Guy's Hospital.

Lilah Clinch, L.D.S.Irel., *Secretary*; Orthodontist, London County Council; Orthodontic Assistant, Children's Hospital, Birmingham.

The Committee are indebted to Mr. H. T. A. McKeag for advice.

This Report has been approved by the Council of the Society and signed by the majority of the Committee, namely :—

Mr. J. F. Pilbeam, *Chairman.*
Professor S. Friel.
Mr. N. Gray.
Miss L. Clinch.

Mr. H. T. A. McKeag supported the majority.

Terms of Reference.—To make proposals for :—

(*a*) The orthodontic treatment of children attending elementary schools.

(*b*) Postgraduate orthodontic teaching.

---

1. The British Society for the Study of Orthodontics, which is the Society concerned with orthodontics in Great Britain and Ireland, submits the following observations on the organization of postgraduate teaching and the provision of orthodontic treatment for elementary school children.

2. It is important that all children suffering from malformation of the jaws and irregularity of the teeth should have an opportunity for expert advice or, if necessary, treatment. The high cost of treatment by private practitioners is an insuperable barrier for the great majority of children in attendance at public elementary schools and provision for free or partly free treatment on a suitable scale should be made by local authorities.

3. The first orthodontic scheme was started many years ago in the Borough of Heston and Isleworth, and this lead was soon followed by Croydon and Cambridge. In recent years three County Authorities have organized orthodontic schemes : viz. the London County Council, Hertfordshire and Middlesex. In many areas, both county and borough, a considerable number of children receive treatment for simple dental irregularities of the jaws and teeth, although individually these authorities may not have complete schemes. The teaching hospitals, the Eastman Dental Clinic, The Hospital for Sick Children, Great Ormond Street, The Children's Hospital, Birmingham, and the Birmingham General Dispensary have orthodontic departments where a limited number of cases are treated.

4. It has been shown quite conclusively that the employment of specialists by the London County Council has resulted in a greatly improved orthodontic service.

5. Untreated malocclusion can be harmful to the health of both the child and the adult. Although teeth in well-formed jaws are also subject to disease, there must be a greater tendency to dental ill-health when teeth are not in alignment. Excessive protrusion of the teeth and a recessively placed lower jaw upsets the balance of facial harmony, and this may have a disturbing effect on mental makeup, resulting perhaps in infelicity and a leaning towards an inferiority complex. Nasal and dental deformities are frequently associated. Many ear, nose and throat surgeons refer all cases showing these symptons to dental surgeons for advice. The orthodontist can be of great assistance to the speech therapist, as difficulties in speech are caused by misplaced teeth.

6. While a few investigators have reported a high incidence of malocclusion in elementary school children, there is also reliable information to be found that treatable dental deformities are about 5 per cent of the school population. In the published Annual Report of 1937 of the County Borough of Croydon, out of 17,747 children examined 583 (i.e. 3.2 per cent) were referred for orthodontic treatment. In the Annual Report of 1941 of the Middlesex County Council an average of 7 per cent. was referred for orthodontic treatment. In one London County Council district, in 9 months of 1943 1,004 children were examined, of whom 3.7 per cent. were found to require treatment.

7. Although some children can be treated by the extraction of teeth and others by appropriate muscle exercises, sometimes needing no subsidiary orthopractic attention, it is estimated that about 5 per cent of the children need protracted treatment with fixed or removable appliances. The number of new entrants into the schools each year is approximately 500,000 (England and Wales), and 25,000 of these would need orthodontic treatment. The maximum number of new cases which could be started by one whole-time orthodontist in one year is 250. Thus we estimate that 100 orthodontists would be needed for a comprehensive school orthodontic service. At present there are only three orthodontists employed on a part-time basis in the school service, and much will have to be done to encourage dental surgeons to specialize in the practice of orthodontics before all local authorities can hope to have a specialist service for treating dental deformities.

8. The model scheme of lectures for undergraduate education in orthodontics which is also submitted has divided the course into two Parts. Part 1 is taken by all students, but does not include instruction in remedial treatment or technique. Part 2 is an optional course, and includes a small amount of remedial treatment and technique. It is essential that all students should receive a survey of the subject of orthodontics as a whole and undertake a detailed study of those parts that will enable them to recognize malformations in their early stages. Accordingly, orthodontic treatment in the school dental service should be conducted by specialists who have received an adequate postgraduate training. It is not possible to include a full training in orthodontics in the undergraduate course because :—

(*a*) The necessary range and volume of knowledge and skill for the satisfactory practice of orthodontics cannot be acquired in the time available in the undergraduate course.

(*b*) The majority of students have not the aptitude or inclination to undertake orthodontics.

9. The limited orthodontic treatment now available for the population as a whole, as mentioned in paragraph 3, is mainly on account of the small number of trained orthodontists. In spite of the need for postgraduate teaching in orthodontics, no organized postgraduate course for the training of specialists is available. Orthodontists either have gone abroad for training or have made private arrangements for tuition by established specialists. The expense of the former course limits the number who can undertake it. The latter course also puts limitations on the numbers and involves a kind of training that is limited in scope and value.

10. The first step then in preparation for a comprehensive scheme of orthodontic treatment is the provision of postgraduate teaching facilities in order to train more orthodontists. There are two possible approaches to this :—

(*a*) by making provision for postgraduate training in dental schools generally.

(*b*) By making provision for orthodontic postgraduate training at one or two special centres.

11. The dispersal of effort involved in (*a*) in view of the few teachers available and the number of students, would make it certain that if all or even a moderate proportion of the existing dental schools attempted to provide postgraduate facilities, none could become first-class for many years.

12. The concentration of effort in (*b*) would enable satisfactory courses to be provided in the most suitable conditions. The difficulty in selecting a particular institution would be great, and weight would have to be given to the staff and facilities available.

13. A postgraduate school for orthodontic teaching should be connected with a dental hospital and associated with a University. The connection with a University would make it possible for instruction to be given to members of the University on essential subjects outside the realm of the dental hospital staff. The course should take one academic year of whole-time instruction, and a diploma should be granted. The granting of a diploma would ensure that the qualifications of orthodontists would be of a minimum standard. This is a *sine qua non* for practitioners and teachers in dental schools.

14. The education of an orthodontist requires that he should be taught the material that would enable him to :—

(*a*) Recognize the nature of a malformation.

(*b*) Recognize ætiological factors.

(*c*) Treat cases of malformation.

(*d*) Understand current orthodontic literature.

(*e*) Undertake research.

15. A research department should be an essential part of a postgraduate orthodontic school, not only for training students in the elements of research but also to carry on research into diagnosis, ætiology and prevention of malocclusion. The director of the school should have facilities to visit postgraduate schools and research departments in other countries to keep in touch with developments of research.

Objects of Course.

16. Training of orthodontists for the school dental service, private practice, teaching in dental schools and research work.

Duration of Course.

17. One academic year whole time. This is the minimum time necessary to give adequate instruction in the orthodontic and contributory subjects and to afford sufficient experience of the progress of cases under treatment.

Entrants.

18. Preference should be given to graduates who have had a good dental school record and whose qualification has been recently obtained.

Diploma.

19. A diploma after examination should be granted to those obtaining the required standard. Examinations should be held on theoretical subjects. Account should be taken of clinical work done and of theses and reports on research carried out during the course.

The curriculum of the course, and details of the staff, accommodation, equipment and estimated cost of the postgraduate school are appended at the end of this report.

20. It is recommended that where possible orthodontic treatment should be carried out in Health Centres, where the orthodontist can work in collaboration with dental and medical officers, rhinologists, radiologists, etc. In rural districts these centres should be in the principal market towns and where necessary travelling allowances should be made to patients to eliminate excessive travelling for the dental and medical staff.

21. Preventive orthodontics must be a part of the ordinary school dental service, and adequate provision must be made to preserve the deciduous dentition. Early loss of the deciduous teeth or the first permanent molars may produce irregular dentitions or, where irregularities already exist, may complicate treatment, making a good result impossible.

22. The standard of children's dentistry is not satisfactory, and it is recommended that a special course in pædodontics should be included in the curriculum of all the dental schools.

Appendix

Proposed Postgraduate Orthodontic School

Curriculum of Course.

Lectures and clinical or laboratory instruction in :—

(*a*) Genetics. Dental embryology. Œcology. Physiology of bone and muscle. Endocrinology. Otorhinolaryingology. (Attendance at a children's ear, nose and throat department of the Out-patients of a teaching hospital should be included.) Dietetics. The dentition throughout life (lectures and clinical instruction to be given by an experienced dental surgeon).

(*b*) History of Orthodontics. Development of the dentition, normal and abnormal. Ætiology, diagnosis and treatment of malocclusion. Appliance design and technique. Clinical teaching.

The lectures on the subjects under heading (*b*) would be given by the members of the orthodontic school staff.

Staff and Salaries.	*Minimum salaries.*
Director	£1,500 per annum
Senior Assistant	£1,000 ,, ,,
Junior Assistant	£800 ,, ,,
Radiographer	£250 ,, ,,
Mechanic	£300 ,, ,,
Laboratory Assistant (Model Construction)	£150 ,, ,,
Dental Attendant	£160 ,, ,,
Secretary	£250 ,, ,,
Selected Lecturers on : Genetics, Œcology, Embryology, Physiology of bone and muscle, Endocrinology, Otorhinolarynology, Dietetics, The dentition throughout life	£500 ,, ,,

	Estimated cost
Total Salaries (estimated)	£4,910 per annum

It is estimated that this staff could train 18 students each year.

Accommodation.

Clinical department.
X-ray and photographic department.
Mechanical laboratory.
Research laboratory.
Library.
Lecture room.
Director's room.
Staff room.
Common room.
Office.
Waiting rooms, etc.

Equipment.

Dental chairs, spittoons, bracket tables, cabinets, electric-engines, table and hand lathes, orthodontic instruments, etc., X-ray, and photographic apparatus, welders, materials.

Research laboratory equipment :—

Microscopes, etc., Broadbent-Bolton X-ray cephalometer, photographic apparatus, gnathostatic and anthropometric instruments, muscle dynamometers.

Mechanical laboratory equipment.

Estimated Cost.

Salaries	£4,910 per annum
Rent of accommodation	£800 ,, ,,
Library	£100 ,, ,,
Research department	£500 ,, ,,

Total annual Expenditure, £6,310.

Capital Expenditure on Equipment, £5,000.

Mr. Ernest Rix ***and*** **Mr. Harold Chapman,** ***members of the Special Committee, were not in agreement with the Report and their comments are as follows :—***

1. We, two members of the Committee, differ from the majority upon certain items of their report : our major differences are hereunder.

The Post-graduate School.

2. We think that the capital outlay and large annual expense proposed for training orthodontists is unnecessary and that a scheme of such scope should evolve as experience dictates. We therefore make the recommendations which follow.

3. The post-graduate instruction should be given at one centre, e.g., The Eastman Dental Clinic or a dental school possessing the necessary accommodation.

4. The qualified dental members of the orthodontic staff should be on a part-time basis, their remaining time being spent in private practice, which we believe would be advantageous to them in training others.

5. The expenses of the school should be defrayed by students' fees, patients' fees and, if necessary, grants.

6. There will be an adequate number of patients for the school at the outset, but it may be necessary to make arrangements to ensure a sufficient number when all children receive treatment in school clinics. This also applies to the supply of patients to the teaching schools.

Training of Post-graduate Students.

7. Most orthodontic treatment involves the use of appliances which fall into two groups :—

(*a*) Removable.

(*b*) Fixed.

8. We recommend two courses of training :—

(i) For the use of (*a*), which may be completed in three months.

(ii) For the use of (*a*) and (*b*), which may be completed in six months. This course includes the former.

9. We visualize courses of instruction in which the teaching in based on practice and in which theory, remote from practice, is not included. In our opinion experience in dental practice before beginning either course would be very valuable ; lectures cannot replace this.

10. No amount of training or teaching can create an experienced orthodontist, but in order to accelerate the gaining of experience, students should return to the school for one to four weeks every one, two or three years to see the progress and results of treatment, immediate and remote of cases in the school : this will also provide the opportunity for further instruction : both are invaluable.

11. The number of cases in group (*b*) does not exceed 25 per cent, probably half this percentage is nearer the correct figure ; not more than 25 per cent of the total number of students will require the six months' training to enable them to treat all cases ; the remaining students will be competent to treat cases in group (*a*) after three months' training ; these cases require less of the orthodontist's time than those in group (*b*).

12. We recommend two groups of practitioners :—

(*a*) Those who have received three months' training who would practice children's dentistry, including orthodontics.

(*b*) Those who have received six months' training and would practice orthodontics exclusively.

The treatment provided by the latter group requires more of the operator's time per patient than conservative treatment over the period of orthodontic treatment.

13. We recommend that eighteen orthodontists be trained in group (*a*) (six every three months for three periods, the fourth period allows for vacations), and six in group (*b*) per annum.

Treatment of Elementary School Children.

14. We consider that it is not necessary, practical or economical for all orthodontic cases to be treated by specialists in the exclusive practice of orthodontics.

15. Our proposals make less demands on the professional time of teachers and students for education than those of the majority report.

16. Our proposals make less demand on patients' and operators' time for orthodontic treatment by increasing its availability, because 95 per cent of all children need routine dental treatment and will be more accessible to a dental surgeon than to an orthodontist.

17. For the reasons given in paragraphs 15 and 16, more time will be available for routine dental treatment—a positive health service—required by 95 per cent of school children as compared with the 5 to 10 per cent requiring orthodontic treatment.

18. The authorities seem to have insufficient staff to give a number of children in their care the conservative treatment they need : there is a demand for dental surgeons for this work as well as for orthodontic treatment, for which a healthy mouth is essential.

19. It is not practicable for those practising orthodontics exclusively to be available for children in remote areas because they must practise in centres where there are sufficient cases to enable them to use their additional training constantly ; such practice would correspond to that of specialists in private practice.

20. We are concerned to make the best use of the available dental personnel for the health of elementary school children. It is our opinion that these recommendations will accomplish this end.

21*st Feb.*, 1944.

DEMONSTRATION MEETING, 1945

The following are details of each Demonstration:

Cases Treated by an Inclined Plane Cemented to Mandibular Teeth

K. CORISANDE SMYTH, L.D.S.(Eng.).

A series of 10 cases was shown, the ages varying from 2-10/12 years to 13 years. The feature common to all was lingual occlusion of one or more maxillary teeth, usually central and lateral incisors. Each case was treated by using an inclined plane cemented to mandibular teeth. The appliance can be made in cast metal, vulcanite, or acrylic material. A wax pattern is made and fitted in the mouth, being carved up to the exact shape necessary, the plane being cut down in thickness so that the incisal edge of one or more teeth shows through. This serves four purposes: (1) escape for excess cement when fixing, (2) test as to whether upper incisors have passed sufficiently over the lower incisors for appliance to be removed, (3) aid to removal of appliance with band-removing pliers, (4) ensures minimum opening of the bite during treatment.

The period during which the appliance was worn varied from two months to one week, experience tending towards a shorter rather than longer time for treatment. Two cases showed a completely successful result in one week.

Disadvantages usually associated with this method of treatment are:—

(1) Inconvenience to child—this was proved to be actually at a minimum in each case, lasting less than 24 hours and not being severe in any case.

(2) Permanent opening of the bite—this did not occur in any case, but the danger is a real one, and must be guarded against by seeing patient frequently, and never under any circumstances leaving appliance in place longer than one month without testing the occlusion minus the appliance.

(3) Loosening of teeth, either those upon which appliance is fixed, or those which bite upon it. This was not excessive in any case—not more than in any other method of moving "locked" teeth—and in each case settled down quickly after occlusion became normal.

(4) Unhealthiness of gingival tissues. This is avoided by designing appliance to stop short of all gingival edges, and giving careful instructions for cleaning.

This method of treatment is considered particularly suitable for cases where a maxillary incisor or group of incisors, has been accidentally caught inside the bite, causing what is generally known as a "bite of convenience." In such cases it is mainly the position of the condyle that is at fault, and when the faulty habit of biting is checked, even for a short time, the condyle quickly slips back to a normal position. A very slight movement of teeth sometimes is sufficient to allow of this.

The trauma so often seen around an incisor which is being forced out of its normal position by abnormal occlusion, is immediately improved when the strain upon the tooth is removed, and with suitable local treatment can be reduced considerably.

The occlusion of the molars is, of course, distributed by the forcible change in arch relationship. Usually this is all to the good, but if a temporary malocclusion is caused, this usually settles down of its own accord in a week or so. If not, further treatment can of course, be resorted to. This type of appliance is only designed to treat one feature of a malocclusion which may include many other features.

It is only suggested that this is a simple and (if used with due care) trouble-free method of dealing with a troublesome symptom of malocclusion, the successful treatment of which clears the way for further work.

A Labour-saving Apparatus for Making Orthodontic Models

M. MICHAELIS, L.D.S.(Eng.).

This consists of spring steel forms of various sizes and a glass slab fitting into a plastic base with a back wall at right angles to the base. The apparatus is used on a shelf at eye level and the height of the models is gauged by lines at different heights on the back wall. The teeth are cast first and then the lower model is made in the appropriate form. The upper teeth are then fitted to the lower model with a rubber band in the correct bite and the upper model is cast to make the double pair the desired height. A groove in the metal form fits a notch in the back wall and so keeps the models firm during casting.

A Plastic Jacket Crown as Orthodontic Treatment

M. MICHAELIS, L.D.S.(Eng.).

Serial models were shown of a girl from 9 years to 16 years old. At 9, the right upper central was fractured and the nerve exposed, the right upper lateral being already completely shut out of the arch lingually.

The central was extracted and the lateral moved labially. The case was then left until 16½ when the lateral was fitted with a plastic jacket crown resembling the lost central. The final result made the loss of the central pass unnoticed.

Cases from Practice

HAROLD CHAPMAN, L.D.S.(Eng.).

Mr. Harold Chapman showed two cases in which upper laterals had been removed. In one there was severe malalignment and crowding and in the other there was considerable rotation and crowding. The history and models showed excellent alignment a few years after treatment had been completed.

In another case, the upper laterals had been lost on account of root absorption. There was spacing of 3 1 | 1 3 and proclination of 1 | 1. The parents wished the spaces recreated so that artificial laterals could be put in. This was done. The history showed that the plate carrying the laterals (6 mm. wide, the average being 6.5 mm.) could not be left out except for the briefest time, otherwise relapse occurred. This did happen and the case had to be partly retreated. In addition, at night a plate carrying a labial wire to retain 1 | 1 lingually had to be worn.

Another case was shown in which at age 11-4 1 | 1 were lingual to the lower incisors. This was corrected with an incline plane on the lower incisors and retained with a removable plate. This was not entirely efficient and replaced by another plate which was later so damaged as to be useless, so that an inclined plane had to be used again to correct 1 | 1, following which retention was with a fixed appliance and a lingual wire. Usually these cases do not present this difficulty of retention. In this case it might be due to the later age than usual at which the treatment was carried out.

Another case, with lingual relation of teeth on one side, was treated very easily and successfully with a Badcock plate. The cousin of this patient had a similar condition but his treatment was more troublesome, one upper lateral being difficult to get into alignment. When this had been accomplished there was a marked increase in overbite,

so that retention should present no difficulty. Though there was some excess space, alignment of $\underline{21}$ | was not perfect. No teeth were extracted in these two cases.

In another similar case of three upper incisors being lingual to the lower incisors, with little overbite, treatment with a removable appliance has proved exceedingly difficult, so that after two-and-a-half-years' treatment it is not completed and it seems retention may be very difficult on account of the slight overbite. All four first pre-molars had been extracted. Possibly a fixed appliance would have proved more efficient.

A boy, age 17, presented on account of crowding of lower incisors. $\overline{1}$ | had been knocked out and a lower incisor had been extracted. The alignment of the upper teeth is excellent. He was advised not to have anything done in regard to the lower arch as, if it were, it was bound to affect the upper arch.

A girl age 4-3 was shown with typical Class II, Division I, appearance. The child sucked her right thumb, palm upwards in nearly horizontal position. Two years later the habit had not completely stopped. The lower arch was more forward, almost half a cusp on both sides : there was also improvement in the incisor relations. It was decided to put in an upper Badcock plate to stop the habit and assist in the correction of the irregularity.

Gross Malocclusion Caused and Complicated by Injudicious Extractions

LILAH CLINCH, L.D.S.

Cases were shown illustrating the following conditions :—

(1) Early extraction of the lower deciduous molars in postnormal occlusion of the mandible resulting in inhibition of growth in the lower incisor and premolar areas and forward drift of the lower permanent molars. Treatment of the postnormal occlusion complicated by the reduction in size of the mandibular arch.

(2) Extraction of the lower first permanent molars in postnormal occlusion of the mandible with and without extraction of the upper first permanent molars. Treatment of the postnormal occlusion complicated by the resulting reduction in size of the mandibular arch particularly in those cases where the upper molars were retained.

(3) Early extraction of the upper deciduous molars in prenormal occlusion of the mandible increasing the deficient maxillary growth and complicating the treatment of the prenormal occlusion.

(4) Extraction of the upper first premolars in postnormal occlusion of the mandible where the upper and lower dental arches were well formed and developed. If the postnormality were corrected the spaces could not be closed.

(5) Extraction of one or both lower central incisors causing inhibition of growth in the lower incisor area resulting in close bite, and imbrication of the upper teeth.

(6) False prenormal occlusion of the mandible caused by early extraction of the upper and lower deciduous molars. The mandible is forced to swing forwards and upwards and the upper incisors are lingual to the lowers. This prevents the normal forward growth of the upper incisor teeth.

The results of early loss of teeth in normal growing children were shown to be less serious than in children suffering from deficient growth.

Cases Treated at Orthodontic Clinics of the London County Council

By Miss E. M. STILL, L.D.S.(Eng.).

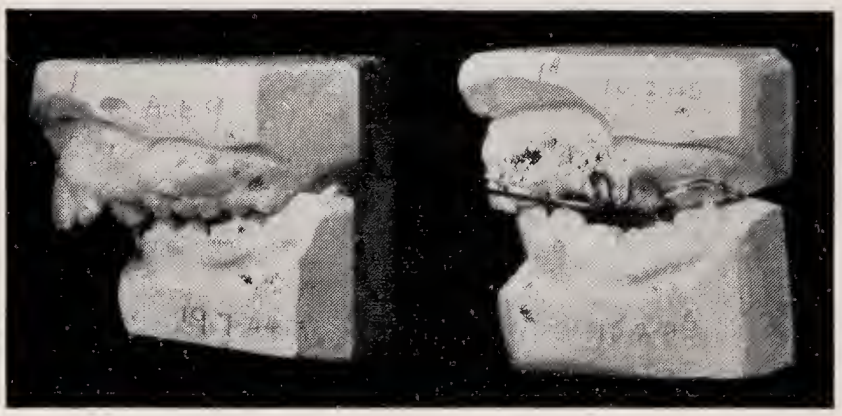

Fig. 1. Class II division 1, treated by a bite plate followed by intermaxillary traction. Model 1a taken at stage at which bite plate was discarded.

Fig. 2. Retraction of an upper canine erupted in contact with the central incisor and forward movement of the lateral incisor into the space created.

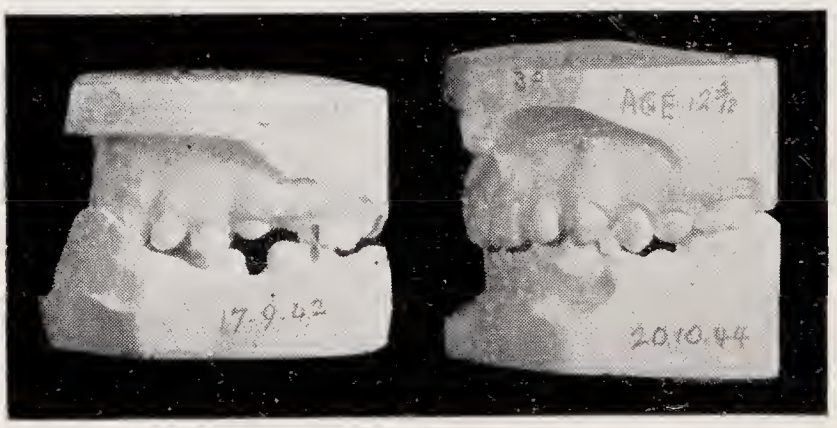

Fig. 3. Class III case treated by intermaxillary traction.

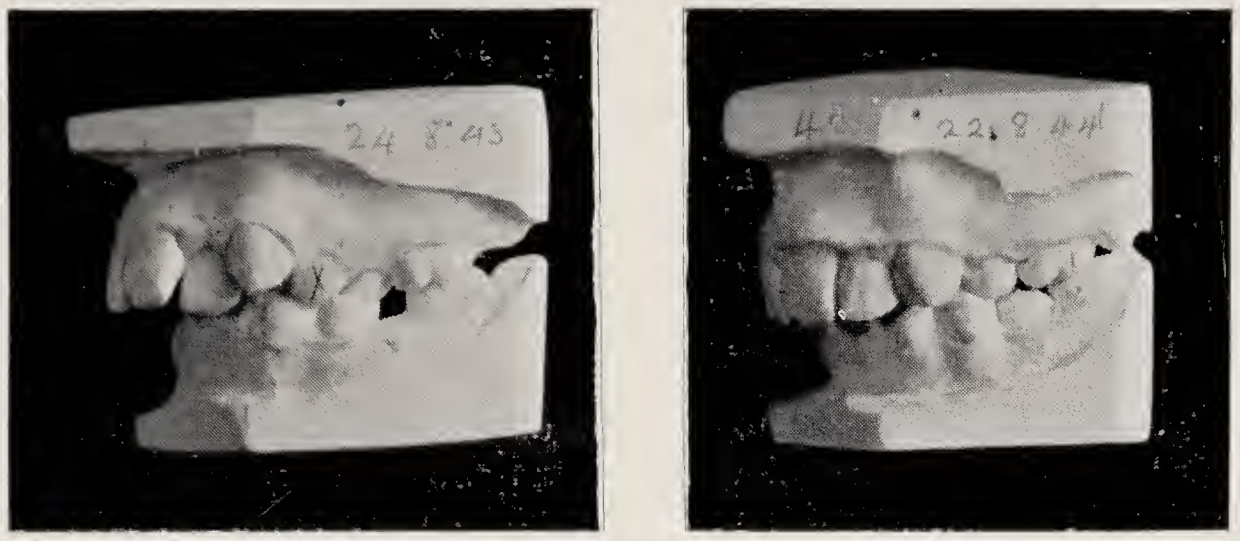

Fig. 4. Case of anterior crowding and severe gingivitis treated by extraction of upper first premolars and the use of an oral screen.

The Orthodontist in the School Dental Service

Miss L. Clinch, in opening the discussion said : An orthodontist is a dental surgeon whose work in confined exclusively to the prevention and treatment of malocclusion. His education should enable him to :

(1) Recognise the nature of a malformation at any stage of its development.
(2) recognise ætiological factors,
(3) treat cases of malformation,
(4) assess current orthodontic literature and
(5) undertake research.

This last paragraph is taken from the report (published in 1944) of the committee appointed by the Council of this Society to consider the orthodontic treatment of elementary school children and post-graduate orthodontic training. That report also recommends that "orthodontic treatment in the school dental service should be conducted by specialists who have received an adequate post-graduate training." The committee estimated that about 5 per cent of the children in England and Wales need protracted treatment with fixed or removable appliances, and that the maximum number of new cases which could be started by one whole-time orthodontist with adequate secretarial and mechanical assistance, in one year is 250.

Therefore in order to provide a comprehensive school orthodontic service, 100 orthodontists are required. At present three are employed on a part-time basis in the school service. And although the authorities are anxious to increase the facilities for treatment there are no orthodontists available. This state of affairs might lead to two disastrous results.

Firstly, that dental surgeons without adequate post-graduate orthodontic training might be employed in the school service. The London County Council for whom I work, have withstood the temptation to do this. I would make a strong plea to other authorities to do the same. Even under supervision the assistance of a dental surgeon who has not had post-graduate orthodontic training (and here I mean education in the theory of the subject, not simply experience in treatment) is useless to the orthodontist if the best results are to be obtained. If the dental surgeon is really keen he will not be satisfied to carry out work which he does not understand and the orthodontist will be forced to waste his time in explanations. I have worked in the orthodontic department of a children's hospital with a highly skilled and experienced dental surgeon who was interested in orthodontics but had had no post-graduate training. It was an unsatisfactory experience for both of us and considerable time was wasted in explanations, which were really useless because the knowledge of the fundamentals of etiology and diagnosis were lacking. There is a danger that the dental surgeon may become familiar with the treatment of cases without having the fundamental theoretical knowledge on which treatment must be based. If he is intelligent he will wish to obtain this knowledge, in other words he will wish to become an orthodontist, and will take a post-graduate course. But if he is less intelligent he may not realise that he has not this knowledge and may feel that his experience of methods of treatment is all that is necessary. The fact that there is a shortage of dental surgeons should further discourage their employment in this work even under supervision.

The results would also be disastrous if the few trained orthodontists were forced to start more cases than they could treat in the best possible way. It is up to the orthodontist to refuse to lower their standards because of the number of untreated cases. One hundred orthodontists are needed, three part-time are available so we must accept as a fact that full provision of treatment is impossible at present. And there

is a danger that we might be tempted to compromise in our treatment and prefer quantity to quality. Unfortunately the standard of orthodontic treatment in this country is already deplorably low. Anyone reading the current orthodontic literature from the United States of America must realise that the results at which they aim, and which on the whole they attain, are incomparably superior to the general run of orthodontics as practised here. And it is our responsibility to see that our standard of work is raised, and that far from reducing the time spent on each case we must increase it. We must not be influenced by the fact that hundreds of children cannot obtain treatment. Our aim should be to provide the best possible service for each case treated, and only to increase the scope of the service as more trained orthodontists become available. One hears queries as to the expediency of fixed or removable appliances in the school service. Expediency should not enter into the matter, and no distinction should be made between the school service and private practice. Each case should be treated with the appliances which will best correct the malformation.

Nobody would respect an E.N.T. surgeon who rushed through two inefficient operations in the time he would have needed to do one efficiently. There is no reason to regard orthodontists differently from E.N.T. work. Both are health services. If a low standard is set here now that orthodontics is becoming a part of the public health services not only will parents not seek treatment but our reputation in the orthodontic world will be discredited. And I think any unprejudiced observer will agree that it is easier to start with a high standard of treatment and to stick to it than to start with a compromise and build on that—particularly in any public service.

I would therefore put forward the following plan which would make the best use of the available specialists while training others.

Firstly : The cases to be treated should be selected with care by the orthodontists bearing in mind that the first consideration should be the health of the child. Considerable experience is needed before those cases in which the health is affected can be chosen with any degree of accuracy. But there are certain general types. In most cases of postnormal occlusion of the mandible there is a considerable improvement in health after correction of the postnormality. This improvement does not occur if the diagnosis is ignored and the upper incisors are retracted leaving the postnormality as before. This may give a quick result which looks satisfactory on models but the malformation has not been corrected and the general health of the patient is still handicapped. This is a common example of the "compromise" treatment which I think should not be encouraged. Traumatic occlusion should be corrected to prevent bone resorption. The psychological condition of the patient should also be taken into account. It is not difficult as a rule to discover if the malformation worries the child, or rather if references to it by others have made the child self-conscious. It is surprising how often a child is anxious to have treatment, and these cases should be treated whenever possible. In this connection I do not think any distinction can be made between boys and girls. Indeed I have found that if anything boys are more sensitive to any physical deformity than girls, possibly because small boys are more prone to jeer at another's peculiarity. Before starting a case the orthodontist should be convinced that there is a reasonable prospect of improvement. If these factors are borne in mind the best use will be made of the limited orthodontic treatment available.

Secondly : To provide the orthodontists. The report of the B.S.S.O. committee to which I have already referred recommends that a postgraduate orthodontic school should be formed and gives an outline of a proposed curriculum. I think that report can be amplified. It

recommends that the school should be associated with a university and a dental hospital. That it should be associated with a university is I think indisputable. Certain subjects, such as statistical method (a knowledge of which is essential for any branch of science and for a proper assessment of scientific literature) are not taught in any dental school or hospital. Indeed I consider that orthodontics has more connection with medicine than with dentistry. Dentistry mainly deals with the diseases of teeth and orthodontics mainly deals with growth. In the B.S.S.O. report with one exception (apart from the subjects to be taught by the members of the orthodontic school staff) the curriculum is composed of medical subjects. It seems therefore important that the post-graduate school should be connected with an institution dealing with diseases of children. Consultations could then be held with medical specialists. This would be invaluable in deciding the correlation between various ailments of children and orthodontic malformations. And the medical staff could be incorporated into the investigations of the school.

To summarise :—

(1) Only fully trained orthodontists should be employed in the school service.

(2) While the service is restricted through lack of orthodontists a careful selection of the cases to be treated should be made in order as far as possible to correct the malformations which are most injurious to health.

(3) The standard of treatment should be the best possible in each individual case.

(4) All efforts should be made to persuade those responsible for the health of the nation to form a post-graduate orthodontic school as soon as possible. This should be associated with a university and connected with an institution dealing with diseases of children.

Mr. J. F. Pilbeam, continued the discussion and said : If we take a glance at the Annual Reports of the Health of the School Child, which is the annual report of the chief medical officer of the Board of Education now the Ministry of Education, we shall find that there is no other physical deformity which affects such a high percentage of children as malocclusion. The position of the orthodontist in a health service is therefore an important one.

What is a Specialist? The Concise Oxford Dictionary states that the specialist is one who devotes himself to a particular branch of a profession. Any dental surgeon devoting his whole time to the diagnosis and treatment of dental abnormalities is therefore an orthodontic specialist. The number of dental surgeons exclusively practising orthodontic treatment in this country is small because opportunities for specialisation are meagre. The Society's Special Committee stated that post-graduate facilities should be provided, leading to the taking of a diploma in orthodontics. But until a post-graduate school is set up and a diploma instituted we must accept things as they are and make a selection of orthodontists to man the service from those we know to have special knowledge of the subject. It would be unfair to the children if we were to wait until an orthodontic post-graduate centre is set up before starting a service.

The Orthodontist's Responsibility in a Large Area. Where a number of orthodontic surgeons are required it is eminently desirable to have one who ranks as a consultant. It is impossible for one specialist to supervise all treatment, and other orthodontists should work to the same plan. They should first attend at several sessions held by the consultant in order to become conversant with methods of the service. From time to time the consultant should visit other centres where orthodontic surgeons are working to collaborate with them in extremely

difficult cases. In this way the consultant can keep her fingers on the pulse of the service.

The Orthodontist's Responsibility in a General Health Scheme. It is important that the orthodontic surgeon should know something about other available health services in order that the work of the orthodontic scheme can be dovetailed into the general health scheme. There may be cases in which it is desired to have the opinion of the E.N.T. surgeon and vice versa. The field of the speech therapist is also one which provides an opportunity for the orthodontist to help. Sigmatism is a symptom which may owe its origin to malformation of jaws and teeth. In the case of the cleft palate orthodontic attention is almost invariably needed. There are many cases of cleft palate associated with irregular teeth. and the orthodontist can often do a great service to the child by efficient treatment.

The Orthodontist and the School Dental Officer. It is of the utmost importance that the greatest possible collaboration should exist between them. The orthodontist must rely on the dental officer for sending suitable cases, and he must also rely on the dental officer for continuing treatment such as adjustment of appliances, etc., as instructed. The orthodontist should use the services of the dental officer to the full otherwise much of the orthodontist's time will be absorbed in doing work which can be satisfactorily done by persons with less orthodontic skill. In a well-staffed scheme the dental officer would save the orthodontist time's by taking impressions of the child's mouth before referring the case to the orthodontist. Skiagrams of the complete mouth, including the third molar regions, could be done beforehand so that when the child is seen for the first time the preliminaries have been done and all is set for the orthodontist to diagnose the case and proceed with treatment. The school dental officer might also refer cases in which orthopractic treatment is not necessarily required, where extraction of a certain tooth or teeth would cure general overcrowding. Advice is sometimes needed from the orthodontist concerning carious six-year-old molars where their conservation or extraction presents a problem in mouths in which slight over-crowding exists.

It is sometimes said that all orthodontic treatment should be undertaken by dental officers in order to provide variation in their work. In these days the field of practice for dental officers has been expanded and many enjoy a full-scale treatment service which enables them to keep abreast with all aspects of dental treatment, similar to that given by private practitioners. At one time I was in favour of dental officers doing as much orthodontic work as possible but in recent years I have greatly modified my views. While I do think that the work is undoubtedly better done by the orthodontist, I must say that in view of the large number of children with dental deformities who require treatment, it is necessary for dental officers, whenever possible, to undertake some treatment for the simple deformity such as lingual occlusion of one or two teeth to relieve the orthodontists of simple tasks. The undertaking of this work together with the attention required for adjustment of appliances as directed by the orthodontist affords the dental officer some interest in the orthodontic scheme Many dental officers have told me that such a method of providing an orthodontic service is, from their point of view, the best and they become interested in the work.

The success of an orthodontic scheme greatly depends on loyalty between orthodontist and dental officer and vice versa. It would be invidious for an orthodontic surgeon after examining a child to say to the parent that the deciduous teeth lost should not have been removed because the orthodontist does not know in what condition the teeth were before they were taken out. Similarly it would be of the utmost

bad taste for the dental officer, who prides himself on a little knowledge of orthodontic treatment, to criticise the type of appliance worn. I make no connotation that such a state of things would happen but it is a matter which should be given some thought by both parties concerned. Orthodontists are sometimes given to immoderate conclusions when seeing a child who has unfortunately lost teeth and perhaps key teeth. No dental officer would remove teeth unless they were beyond all measure of conservation. It must be emphasised that the school dental service is by no means fully staffed and by sheer pressure of work to the permanent dentition may cause little time to be available for protracted conservation of temporary teeth. At the present time there are many mutilated dentitions but until the school dental service has had time to get sufficient staff for its needs, the orthodontist must, in my opinion, accept the present situation without comment.

Under the School Health Regulations published by the Ministry of Education it is a statutory duty of the chief dental officer to submit a report of the school dental service to be included in the annual report of the medical officer of health. It will be of the utmost interest to include in the chief dental officer's report a detailed statement from the orthodontist setting out all aspects of the work of the orthodontic service. Much valuable data could be given which would provide useful information to other local authority orthodontists and chief dental officers. The regulations also advise that research work should be undertaken, and in this field orthodontists have a great wealth of material on which to conduct scientific study. Perhaps there is no other field in public health practice which is so barren of scientific investigation and it behoves all orthodontists in the service to undertake items of research. As an example, some orthodontists talk of arches lacking full development but when a glance is taken of the child it is frequently seen that the skeleton is well developed. Although there may be maldevelopment of the dental arches it is difficult to correlate this to a well-grown skeleton. Here is one type of case in which further study is needed ; there are many others.

The Organisation of a Scheme for the Orthodontist. The first organised scheme to receive the imprimatur of the Board of Education was at Heston and Isleworth. This scheme was based on an orthodontist visiting the clinics in the Borough at regular intervals. The dental officer at the clinic attends with the orthodontist and details of diagnosis and treatment are taken down by a clerk so that no time is wasted by the professional staff during the sessions. The dental officer subsequently carries out the treatment as specified. Unless the dental officer has ability to make fixed appliances the type of treatment under this organisation must be by removable appliances. Another local authority has employed a modification of the Heston scheme, and in this area the orthodontist visits the clinics and with the help of the dental officer as an assistant, treatment is carried out. The orthodontist taking with him a welding machine and instruments so that all types of appliances may be used. In large populated areas I prefer the setting up of central, well-equipped clinics to which dental officers refer their cases and at which the orthodontist does all actual treatment. This simplifies arrangements for radiography and for the construction of fixed and removable appliances. At Bonn before the war there was organised a clinic which was called " a mass orthodontic centre," and the central orthodontic clinic in this country can be likened to the Bonn experiment.

The Dental Attendant's Place in the Orthodontic Scheme. A well-trained dental attendant is invaluable to the orthodontist. The attendant must have clerical ability and one with a practical bent is an advantage so that she can be trained to cast and trim models

and do an odd job of welding. An assistant with some knowledge of photography to take photographs as directed by the orthodontist will be an asset to the centre. In any post-graduate centre for training orthodontists, provision should be made for the training of dental attendants as assistants to orthodontists.

The Orthodontist and the Dental Technician. I do not propose to enter the field of controversy as to the comparative merits of fixed and removable appliances, but what I do feel is that in the public dental service it is essential that as many children as possible who suffer from malocclusion should be treated, and if all appliances to be used are to be of the fixed type then a comparatively small number of children will be treated. The removable appliance can be a useful method of mechanotherapy in certain cases. It is interesting here to point out that the Vienna School whose functional therapy, which is based on removable appliances to be worn at night only, has proved that much excellent orthodontic treatment can be done by means of the removable appliances. Tischler by means of a system of retention with "arrowhead wiring" has used removable appliances successfully in cases of intermaxillary retraction. Many British dental surgeons undertaking much orthodontic treatment have also obtained good results with removable appliances. The success of this type of apparatus greatly depends on the design as mapped out by the orthodontist, but the practical interpretation of the instructions by the dental technician so that he produces the right article, is equally important. In my opinion no technician can construct removable orthodontic appliances unless he has been well trained in methods employed in mechanotherapy. The orthodontic post-graduate school must therefore have facilities for training the dental technician. His attendance at the surgery with the orthodontist would enable him to receive his instructions at first hand and to see for himself the work his appliance has to do and this would make for greater all-round efficiency.

The President said that there was very great need for a post-graduate school and he thought that one should be started at the earliest possible moment. It was not generally realised how much training was required for an orthodontist. To try to carry out orthodontic treatment without experience was like trying to make bricks without straw. As Mr. Pilbeam had said, the men and women with experience in orthodontics should be used to carry out the work, and he thought the Society was qualified to pick out men and women up and down the country who were doing very good orthodontic work.

During the war he had been called upon to examine children at a clinic and he had had to examine as many as 130 an hour, in order to see what treatment they needed. He found that their need was appalling and there was no one available to give even ordinary dental treatment. The medical officer asked him whether he could help, and he agreed to give one session a week and said that he could ultimately do the orthodontic treatment for the children. The medical officer said that there were not many orthodontic cases, but after a few months he had got thirty active cases and dozens of cases on the waiting list.

After a post-graduate school had been established it would be possible to build up a satisfactory expert service, but in the meantime he would urge that orthodontists in private practice should give one session a week to orthodontic work in the school dental service.

Miss K. C. Smyth was unable to be present at the meeting but sent a written contribution, excerpts from which were read by the President.

Experiences in carrying out orthodontic work under three different

education authorities during the war were described. As a result of these experiences Miss Smyth concluded as follows :

It should be the aim of the school dental service to appoint as many specialists as may be required for the treatment of all orthodontic cases. This will obviously be impossible for several years, so in the meantime a compromise is necessary.

It is not at all desirable that orthodontic work should be carried out by all dental officers, even under expert supervision. Only a small proportion of dental officers is sufficiently capable and keen on the work to be able to co-operate satisfactorily with a specialist in treatment. Generally speaking, co-operation should be limited to talks with the specialist aimed at helping the dental officers to select suitable cases for treatment and to carry out first-aid repairs and adjustments to appliances and occasional clinical meetings to show the dental officers their own cases during and after treatment, if a desire for this is expressed.

Dental officers specially selected for their keenness and aptitude for orthodontics, or other dental surgeons specially appointed by reason of some previous experience of orthodontics, can be used in the capacity of assistant to the specialist, enabling the specialist to concentrate on diagnosis and planning of treatment. This should be regarded as a purely temporary measure, made necessary by the extreme shortage of fully-trained orthodontic specialists. Such assistants should be given every encouragement to take a complete post-graduate course as soon as such a course is available, to enable them to qualify for the position of a specialist.

The practice of requiring the specialist to visit several different clinics which are not properly equipped for orthodontic work is not desirable, though it may be inevitable to a certain extent in rural areas. As far as possible there should be one clinic, properly equipped for orthodontic work, to serve each area, and transport should be arranged for the children to visit the special clinic.

The ideal must be kept constantly in mind whilst building up orthodontic services all over the country, but the compromise outlined above should enable a much larger number of cases to be dealt with during the next few years, with a fairly high degree of efficiency, and would help to meet the enormous demand for treatment. Miss Smyth considered this compromise desirable rather than to sit back and accept the fact that no cases must be treated except the very small fraction which could be dealt with by the few specialists, or the alternative that large numbers of dental officers entirely untrained and without guidance, should do the best they could, thereby creating orthodontic havoc.

Mr. C. F. Ballard said that he agreed in principal with Miss Clinch but he thought some compromise must be made so that children who needed orthodontic treatment could be given that treatment.

He was quite sure that treatment by so-called judicious extraction to produce an æsthetic appearance, though it might satisfy the child's parents, would produce a mouth that would not withstand paradontal disease later in life. He had seen many cases which had been treated by extraction in order to avoid treatment by appliances, and in a few years' time the teeth would be lost as a result of the correction of the occlusion.

One useful feature of orthodontics in school work would be the serial study of the development of the children, which would give a far better idea of diagnosis than had been available before, on the lines of the work done by Broadbent in America. He thought that until a really scientific study of the development of the child was undertaken it would not be possible to obtain a scientific basis for diagnosis. Moreover, the children for whom orthodontic work had been done should

be followed up, in order to see the results of the orthodontic treatment in the adult.

Mr. Oliver said he agreed with Miss Clinch that orthodontic work was extremely technical and difficult, and he had been very pleasantly surprised, whilst he had been working in the public services, at the extremely good orthodontic results that had been obtained under very difficult conditions. He was sure that anyone who worked in the school dental service would support him in saying that the number of children to be dealt with was so great that there was not sufficient time available for diagnosis.

He agreed with Mr. Pilbeam that there was a very great need for orthodontic treatment. He hardly ever attended a clinic without seeing a case that he wished to refer for orthodontic treatment, but unfortunately he could not start treating all of them at once. He did not claim to be an orthodontic specialist, but he felt that in his humble way, with a comparatively few years' experience in the work, he could get sufficiently good results in a certain number of simple cases to justify his starting and going on with them, and he thought that was the line that should be taken at the moment.

He was entirely in agreement with those who stressed the desirability of establishing a post-graduate school where training in orthodontics could be obtained. He thought that was the only way in which a sufficient number of highly skilled orthodontists who could act in an advisory capacity would be obtained, and it would make a very great difference if school dental officers could have access to really skilled help. They would then, he thought, be able to obtain satisfactory results in a large number of cases with which they could hope to deal at present.

He supported Mr. Pilbeam in saying that a start should be made at once, in the hope that all the good work which had been done by the committee of the Society would not come to nought.

Mr. Taylor, speaking as a dental officer who was doing part-time school dental work, said that the initial diagnosis of malocclusion was made by the school dental officer when he saw the child at the school inspection or when the child came to the clinic, and he then said that the child must see the orthodontic specialist. Very often the school dental officer was not really competent to make the preliminary diagnosis ; he was not always sure what kind of case was suitable for orthodontic treatment, nor was he certain of the age at which that treatment could be best given. Moreover, he knew that if he referred a case to the orthodontist he might be put on a waiting list, because there were so few orthodontic specialists in the school dental service, and might not be seen by the orthodontist for perhaps a year. If a child was 12 years of age when it was first seen at the school dental inspection (it might have come back from evacuation, for example, or have been absent from previous inspections) it might be 13 before it was seen by the orthodontist, who would probably then say that it would be impossible to get anything like an ideal result in the case. Again, at school inspections children at the age of 5 were seen with quite obvious malocclusion of the temporary dentition which the school dental officer, judging from other cases that he had seen, was fairly sure would be reproduced in the permanent dentition. Should he refer such cases at once to the orthodontist, or should he wait until he saw them again two or three years later, when the malocclusion had become evident in the permanent dentition ? He thought that the school dental officers throughout the country wanted some kind of lead from the orthodontists, so that they would know what the orthodontists wanted them to do and the line of treatment which they should

pursue in the interim period before the children could be seen by an orthodontist.

Orthodontists sometimes said : " Why do school dental officers take out temporary molars ? " The school dental officer was often faced with an impossible position. A child had septic temporary molars and he had to remove them, and he was blamed by the orthodontist for doing so. The orthodontist should know a little more about the difficulties with which the school dental officer was faced. When the school dental officer saw a couple of temporary molars with proximal caries, what was he to do ? Was he to leave them there ? He probably had not time to conserve them, and if he allowed them to wait for a year or two they would have to be taken out to let the 6's come forward. He had heard orthodontists at meetings of the Society say that they preferred temporary molars to be allowed to remain even when they were in a septic condition, but he thought, in saying this, orthodontists were not sufficiently realistic. The great benefit of meetings such as the present one was that orthodontists and school dental officers could meet one another and exchange ideas and thus educate one another.

Miss Clinch had not mentioned the other report prepared by the Society, which he thought really went to the root of what he was saying and in which the opinion was expressed that dental students should not receive a very extensive education in orthodontics but should receive an elementary education in the reasons for malocclusion taking place and the ætiology of malocclusion. He entirely agreed with that. If the school dental officers had more insight into malocclusion they would be in a much better position to know the right cases to send to the orthodontist.

With regard to Mr. Pilbeam's suggestion that orthodontic treatment should be pursued at the present time, whether orthodontic specialists were available or not, he could see one real difficulty in that, namely, that school dental officers in remote areas of the country would be practising orthodontics and it would be some years before orthodontic specialists could be allocated to those areas. When an orthodontic specialist was allocated to such an area, he would probably find that the dental officer had very crude ideas about orthodontics but might have produced excellent results in a limited number of cases, encouraging him to persevere in the practice of orthodontics, regarding himself as a specialist by reason of his experience, although he had not taken a course in the subject. To take a course in orthodontics was far the best method of acquiring experience in the subject, as it enabled one to take advantage of the pooled experience of all orthodontists. Therefore he could not entirely agree with Mr. Pilbeam's suggestion, but he wished to support wholeheartedly what Miss Clinch had said.

A Visitor said that there was a shortage of dental surgeons in this country, and she thought that one of the ways of solving that problem was to make the profession more attractive. Similarly, in connection with the proposed post-graduate school, the practice of orthodontics should be made more attractive. If it was regarded as important that more orthodontists should enter the public health service, greater efforts should be made to attract them to that service from private practice.

Mr. Aitchison said he had been greatly interested in what had been said by the previous speakers. He had received his first teaching appointment in orthodontics in 1924, before he knew anything about orthodontics, and since then he had slowly improved his knowledge of the subject, both by study and by practice. During the last few years he had been engaged in school dentistry, and, while he would like

to advocate the midway course between that advocated by Miss Clinch and that put forward by Mr. Pilbeam, he would go further than either of them in one respect and say that no one was competent to take a senior post in school dentistry who had not a very sound knowledge of orthodontics. Although at the present time a tremendous number of children required orthodontic treatment (in the slum area where he was now working the percentage was considerably higher than the 5 per cent mentioned by Mr. Pilbeam) in a great many cases there were school dental officers who were incapable of assisting in an orthodontic scheme. An orthodontic scheme could do more for the good of dentistry, as an advertisement, than any other dental treatment could do, but the converse was also true, and orthodontics in the wrong hands could do more damage not only to orthodontics but to dentistry in general than anything else. If all dentists holding senior appointments in the school dental service had a sound knowledge of orthodontics they would be able to select those school dental officers who would be able to assist in an orthodontic scheme, until such time as only specialist orthodontists carried out the treatment.

A Member said he would like to thank Miss Clinch for her lucid explanation of the course which she thought ought to be pursued, and he would like also to thank Mr. Pilbeam, whose scheme he thought would have to be adopted in the present state of affairs.

He was very glad to hear that so much interest in orthodontics was being aroused in the powers that be, because they had not appeared to him to take much interest in the subject. At the moment they were trying to take away from the Manchester Dental Hospital an orthodontist who was treating nearly 2,000 patients, with the help of students and he had written to the local Member of Parliament to see whether he could do anything to help in the matter, because if the orthodontist was taken away a great many children who were very badly in need of treatment would have to remain untreated.

He agreed with Miss Clinch that diagnosis was a most important matter, and it could be done only by someone with a good deal of experience ; therefore an experienced orthodontist should diagnose the cases and he should also prescribe the treatment, which could be carried out by an ordinary dental surgeon.

With regard to the treatment that should be given in the case of a deciduous molar with a small cavity, the tooth should be treated with silver nitrate, to make it last as long as it was required to last, so that it could maintain its space until the coming of its successor.

With regard to the interest which was being taken in orthodontics, he was now giving a post-graduate course at Manchester, and it was being attended by thirty qualified dentists, who came from all over the Midlands and Lancashire, some of them from places a very considerable distance from Manchester.

Miss Rees, speaking for school dental officers who had done a certain amount of orthodontics in the last few years, because it had not been possible to send the children to a specialist, asked whether there was any likelihood of those dental officers being able to attend the post-graduate course which was proposed, so that they would be better able to assist the orthodontists in their work.

The President said it was hoped that when the post-graduate school was established the school dental service would be the principal supporters of it and that the Ministry would pay the fees, or at least pay for the maintenance, of the dentists taking the post-graduate course.

A Member suggested that, from the practical orthodontic point of view, the way to learn was by experience. If a dental surgeon had a few cases which relapsed, he would thereby learn something. He thought the Society should direct its attention to diagnosis, prognosis and discussion of the subject and should tackle it from the point of view of what really was possible in individual cases.

A Member said he did not think that the difficulties of the subject of orthodontics had been sufficiently emphasised. The longer orthodontists practised their profession the less they felt that they knew about it. He agreed that there was undoubtedly a need for a post-graduate school.

Mr. Tait said he did not think that the value of a school orthodontic service would be fully appreciated until it had been in existence for thirty or forty years. He was under the impression that the main aim of a large number of orthodontists was to produce nice-looking arches, the æsthetic factor being paramount in their minds. He was interested in paradontal disease, and he saw a number of cases which had been apparently successfully treated by orthodontists in years gone by—certainly the arches had been got into a pleasant-looking shape—but in which the whole mouth was being ruined by the advent of gross paradontal disease. He thought it was very difficult to say precisely why that happened, but he had no doubt that it was due to a considerable extent to the fact that the cases had been treated by extractions. The technique of symmetrical extractions round the mouth often had the effect of collapsing both arches into a nice-looking shape, but the whole function of the mouth was so disturbed that in the long run it would have been better to leave the patient in his original condition.

He suggested that the school dental service could make a very valuable contribution to the study of orthodontics in the way which had been touched by Mr. Ballard, namely, the taking of serial models and studying the shape of the mouth. Mr. Chapman had often stressed the fact that a very great deal could be learned by studying the normal, and in that connection the school dental service could make a very useful contribution. Orthodontists saw chiefly abnormal cases, but he was sure there was a great deal to be learned by studying the growth and development of cases which did not need any treatment.

He thought attention should be given to the question of the salaries of those dental surgeons who took the proposed post-graduate course. If the post-graduate school was to produce really skilled orthodontists, the course would not be a matter of just a month or two, and if dental surgeons were to spend a considerable amount of time in post-graduate study they should be offered some appreciable increase in remuneration at the end of the course. He had recently seen an advertisement by a dental school for an orthodontist at a salary which was less than that given to a school dental officer.

A Member said he would like to suggest a scheme for orthodontics in schools which would save a great deal of time and possibly result in more children being treated at the moment. He suggested that when a school dental surgeon saw a child who required orthodontic treatment he should take an impression of the mouth and send the models and any data that he might think important, together with his diagnosis and proposed treatment, to an orthodontic specialist. If the specialist agreed with the diagnosis and proposed treatment, the school dental officer should give that treatment. If the specialist did not agree with the diagnosis and the treatment that were suggested, he should treat the case himself. He thought that orthodontic treatment by an orthodontist was the ideal to be aimed at, but until there were enough

orthodontists to give the treatment the plan he had suggested would probably be the best to adopt.

Miss Caseley said she agreed that there was a need for orthodontic specialists, but she thought that school dentists should be given as much interest as possible in their work and should not be deprived of variety in it. School dentists had so many opportunities for research into the normal as well as the abnormal that their help in orthodontic work would be of great value.

Mr. H. G. Watkin said he would like to know how many school dental officers present had ever put in a spacer to retain a space after they had extracted a deciduous molar. It took a quarter of an hour at the most, with German silver and cement, to put in a spacer and thus prevent malocclusion.

The President said he did not want school dental officers to feel that they would be deprived of orthodontic work. He hoped that they would be able to take it up seriously and would find that their status in the school dental service was improved thereby. His opinion was that school dental officers should take part in orthodontic treatment and he hoped that that would attract to the service some of the dental officers who would be coming out of the Forces.

(*At this point the President had to leave and the chair was taken by Mrs. Lindsay.*)

Mr. R. Cutler said he thought the salient point which had emerged from the discussion was the growing need for the provision of skilled orthodontists, and clearly the institution of some form of post-graduate school was a logical method of achieving that end, but he did not think it was impossible for a dentist to become a first rate orthodontist without going to any post-graduate orthodontic school, provided that he had access to ample clinical material, was able to make a critical evaluation of the results he obtained and was intelligent enough to read the literature on the subject. Up and down the country, as Mr. Gray had pointed out, there were first-rate orthodontists. The danger of any post-graduate school was that it might produce a priestly caste, the orthodontic Brahmans, whilst those orthodontists who did not go to the post-graduate school would become the orthodontic untouchables. There was not the slightest doubt that many excellent orthodontists had never been to an orthodontic school. Some people said, quite rightly, that the gradual evolution of the skilled orthodontist who did not go to an orthodontic school was a wasteful process, that he spent years in making mistakes and profiting by his mistakes until he at last became a skilled orthodontist, whereas he would have avoided those mistakes if he had been to an orthodontic school. That was a fair criticism.

He thought the suggestion made by Mr. Gray, that in the present emergency men who were known to be good orthodontists should be employed as temporary consultants in the school dental service, would be a very great help, and it might well be adopted until such time as the first-fruits of the proposed orthodontic school became available. It might be said that the majority of good orthodontists were on the staffs of their local hospitals and that their time was fully occupied, but he could think of quite a number of men for whose orthodontic diagnosis and technique he had great respect and who were ploughing their own furrows. He thought that if they were suitably approached their assistance might well be secured to fill the hiatus in the school dental service.

A Member said she had no doubt that a post-graduate orthodontic course was necessary but she thought the root of the whole problem

lay in the shortage of dental surgeons. If school dental officers had to do orthodontic work at present, there was no question that it had a detrimental effect on the ordinary work. She fully agreed with the statement that had been made that school dental officers liked to do a variety of work, but it was a fact that if they had to do orthodontic work at present the children were not seen so regularly for ordinary dental treatment.

Miss Clinch, in replying to the discussion, said that Mr. Pilbeam and she had two different points of view and she was somewhat disappointed in Mr. Pilbeam, because he had signed the report in which it was said that only specialists should be employed as orthodontists in the school dental service. Her point, to which she still adhered, was this : If a compromise was made now and dental surgeons without orthodontic qualifications were employed as orthodontists in the school service, what would happen to them when the post-graduate school came into being and a hundred trained orthodontists were available after a few years ? Would they all have to go back to doing ordinary dentistry, after having spent some years in orthodontics ? It would be very hard on them if that was the case, yet it was the only solution of the problem. She would prefer all the available dental surgeons who had not had post-graduate orthodontic experience to be employed in dental surgery. If they spent their time doing orthodontics as well, a great deal of dental surgery which should be done would not be done, as there was a shortage of dental surgeons. If there were plenty of dental surgeons and a shortage of orthodontists, she thought that Mr. Pilbeam's case would be a stronger one, but, as there was a shortage of dental surgeons, surely all those that were available should be used where they would be of most value and in doing the work for which they had been trained.

Mr. J. F. Pilbeam, in replying to the discussion, said he agreed with Miss Clinch that a post-graduate school was needed for training orthodontists, and he also agreed that he had signed the report to which Miss Clinch had referred, but at the moment there was a difficulty. Parents were pressing for an orthodontic service for their children, and he did not think it was right to hold up that service on the ground that at the moment there were not enough orthodontists to man it. He thought there must be a makeshift service until there were sufficient orthodontists available.

With regard to Miss Clinch's question as to whether the school dental surgeons who carried out orthodontic treatment in the meantime would have to return to ordinary dentistry when orthodontists trained in the post-graduate school became available, he thought a few would go back to ordinary dentistry but a number of them would remain in the service as orthodontists. There would be plenty of room for them as well as for the orthodontists from the post-graduate school.

As to 5 per cent needing orthodontic treatment which he had stated, that was a survey percentage which several of his colleagues and he had worked out, but he was inclined to believe that it was a little on the low side. It was based on treatment of actual deformities. Orthodontists would be needed to advise on the preventive aspect of the question, and in that field alone they could do very useful service.

He felt that an effort must be made to give the children some kind of orthodontic service at the moment, and if surgeons with experience and a working knowledge of orthodontics could be engaged the children would have something done for them. It must be remembered that the post-graduate school would take some years to set up, and it would be some time before there were very many orthodontists trained. If it were only five years, that was a long time in the life of a child, and

if some sort of service was not started now a large number of children would have practically no treatment. That was why he advocated, as a temporary measure, the school dental service should be expanded by the employment of dental surgeons who had an empirical knowledge of orthodontics and a knowledge gained through reading the literature on the subject.

With regard to the question of orthodontic work giving variety to the school dental officer, at one time he had used that argument himself, but during the last few years he had gradually modified his views. He felt now that the school dental officer was more interested in an orthodontic scheme if he could refer his cases to an orthodontist and have them returned to him for adjustments to appliances or just to keep a watch on the condition. That provided the school dental officer with a reasonable interest in the orthodontic scheme and a certain amount of variety, and he thought the work was done better in that way than by the school dental officers undertaking treatment for all types of deformity. Lingual occlusion of anterior teeth was a type of deformity which could be treated satisfactorily by the dental officer and it could be cured rapidly ; the treatment was of a spectacular type, and the dental surgeon got a certain amount of thrill out of it. A general orthodontic scheme, however, would be better carried out by orthodontic specialists.

He thought that the chief orthodontist in the scheme must be a very capable orthodontist indeed. Through guiding the planning of the service he could keep his finger on the pulse of it and see that it was well run and well controlled.

With regard to the rural areas, to which Mr. Taylor had referred, he did not think that orthodontic treatment could be done well in the general clinics in rural areas. He thought that the work should be centralised so that there could be an *ad hoc* orthodontic clinic. The good bus services nowadays made it comparatively easy for people to reach the main towns.

He agreed with Mr. Aitchison that it was important that chief dental officers should have a good knowledge of orthodontics, but it was also important that they should have a good knowledge of other aspects of dentistry and he could not see that there was any special reason for them to have a particularly good knowledge of orthodontics.

He would like to make it clear that, whilst he advocated, as a temporary measure, that dental surgeons skilled in orthodontics should enter the service to provide treatment, this did not weaken his desire to see fully trained orthodontists employed in the school dental service.

The Chairman, in moving a vote of thanks to Miss Clinch, Mr. Pilbeam and all who had taken part in the discussion, said that the discussion had been a very fruitful and interesting one.

She wished to remind the meeting of the Report on Orthodontic Education which had been issued by the Society, in which there were set out a compulsory course and a voluntary course. She suggested that all school dentists should be obliged to take both courses, as that would help to give them a wider orthodontic outlook.

The vote of thanks to the speakers was accorded with acclamation.

Major-General J. P. Helliwell said he wished to tender to the Society the thanks of all those who had come to the meeting from the L.C.C. Dental Services for the very delightful evening that they had spent. They had learned a good deal and had thoroughly enjoyed the meeting and they thanked the Society very much for its hospitality.

A Layman Looks at Orthodontics

By Prof. E. MATTHEWS, D.D.S.(Manc.), Ph.D.(Lond.), D.I.C.(Lond.)
Turner Dental School, University of Manchester.

Introduction

It is with a certain degree of temerity that I address you to-night at the request of that indefatigable lady, Mrs. Lindsay. Forgive me, therefore, if I betray an ignorance of the technical devices of the orthodontist, and forgive me too if what I say consists of the half-truths of which generalisations are apt to be comprised.

What is an orthodontist?

I have heard it said that an orthodontist is a narrow-minded specialist who spends his time devising gadgets to move teeth around. A thoroughly libellous definition you will agree; but in a subject of such undoubted complexity as orthodontics it is an ever-present danger that the practitioner of the art may lapse into a narrow specialism. The purely mechanistic approach to orthodontics does exist, and with an unfortunate forgetfulness of the health of the mouth as a whole.

Holding as he must the conception of the ideal masticatory face, of which I would add ideal occlusion is only a part, the orthodontist would seem to me to be the best person to direct the dental development of the children of the future. At present it is the general practitioner who is the arbiter of the dental fate of the children and he, occasionally finding, probably all too late, that development is going awry, sends the child to the orthodontist. The orthodontist is thus, as I see him, much like King Canute, protesting vainly against the oncoming waves of malocclusion.

Future role of orthodontists

Preventive dentistry needs the orthodontist who can assume the role of guide towards the fulfilment of a properly developed and therefore efficient masticatory apparatus.

In dentistry, as in medicine, we have been, and we still are, too content to treat disease. The urgent need to-day is to integrate the knowledge derived from the various specialities and to establish a line of conduct for the maintenance of normal health. How much simpler in the main this should be for dentistry than it is for medicine. You, then, as a Society have a great responsibility if you are going to occupy your rightful place in the scheme of things.

Surely it is the orthodontist who should see all the children at regular intervals. He it is who should hold the watching brief and direct the child to the paradontist, conservationist, etc., for any necessary treatment. He it is who should pluck the child out of the main stream for active orthodontic treatment at the right age.

As Spencer has feelingly remarked, "How many of you must have experienced the difficulty of explaining to a parent local factors that have caused malocclusion in a child of say 12 years who has been under the care of a dental surgeon since 3 to 4 years. Surely it is not a fantastic supposition to believe that a great percentage of like cases could be prevented with little expense and effort.

The foregoing raises two important points, first the need for many more orthodontists, second the reason why the general practitioner

often fails to appreciate the time factor in the development of malocclusion.

Need for more orthodontists

Let us deal with the need for more orthodontists first.

On the basis of the position in America where 1,000 orthodontists are said to be in independent practice, here we should have between 200 and 300. Probably the real need is for 500. I understand there are less than 10. It would seem that private enterprise in this country is less vigorous than in America in its relative failure to convince the public as to the need for orthodontic treatment. That the need exists is unquestioned, more so in this country than in America, one would think.

Whether or not private practice continues in the way in which it has previously, the increase already planned in the school health services will undoubtedly call for a large number of orthodontists, and the importance of getting first-class people to man the service is obvious. At present one finds that medical officers of health regard orthodontists as good window dressing material and likely to impress the local health committee with their own progressiveness. So a part-time orthodontist is employed on a severely part-time basis, to straighten the crooked teeth of perhaps a 40,000 child community. The fact that the country is prepared to go on wasting money trying to plug holes in the very leaky ship of the school dental service in this way does not argue well for the dental health of future generations. One looks to you to educate the medical officers and others as to the real need.

Post-graduate school in orthodontia

Professor Friel would have us set up a post-graduate school for the training of orthodontists, divorced from a dental school and situated in either Dublin, Oxford or Cambridge. That a post-graduate training for orthodontists is a necessary preliminary is accepted by all, that it does not already exist is to be regretted, but that it should be divorced from a dental school is just absurd. Obviously the orthodontist must work in the closest touch with his dental colleagues unless he is going to take over the complete care of his patient, which would reduce the value of his specialist services enormously.

No one will question the desirability of close consultation with the pædiatrician and of the impact of nutrition, endocrinology and genetics on certain orthodontic problems. The same holds good for the paradontist with the hypertrophic gingivites of adolescence, or the rampant caries with which the conservationist may have to deal. Are these, too, to be divorced from the dental school? Moreover, we are concerned at the moment with a positive health programme for the masses, and interesting though it may be, the importance of the acromegaloid as an orthodontic problem with its roots in endocrinology should not be over-emphasised.

Not only do I feel that the post-graduate school should be housed in the dental school, but in view of the urgent need for recruitment of orthodontists that there be three such schools in the country. Many others share Professor Friel's weakness for Oxford and Cambridge. So much so that the older inhabitants of those ancient seats of learning are becoming perilously alarmed as to where the continued expansion is leading. Quite frankly, apart from the aura of respectability and prestige which an Oxford or Cambridge appointment might confer on an orthodontist, there is little to be said for it, particularly in view of the absence of a dental school in either place. I agree with Professor Friel as to the weaknesses of London, weaknesses that are not always realised by its members until they have experienced the corporate life of many of the provincial universities.

It would seem that, initially at any rate, a selected group of younger men and women with a real interest in orthodontia should have the opportunity of studying abroad. If then on their return they were associated with the post-graduate schools here for a minimum period of three years much good would derive to both teacher and student. Thereafter entry into the school service as specialist orthodontists should be envisaged.

Undergraduate teaching

The second point that I raised earlier, namely the failure of the general practitioner to recognise malocclusion at a sufficiently early age has its roots in the failure of undergraduate teaching and/or the lack of suitable follow-up refresher courses.

In my experience the average student has little interest in orthodontia, and the reasons are not hard to find. The present dental curriculum is heavily overloaded, and competition between the various subjects for the students' time is very real. Therefore, the department which wins is that in which requirements are heaviest and most strongly insisted upon by those in charge. In this most unfortunate silent battle between departments, the orthodontic department is apt to be the loser. Furthermore, the course is usually limited to a relatively short period, and the student realising that he is not likely to see the final results of his treatment within that time lacks interest. During his stay he is exposed to what to him is a highly complex system of appliances with whose use he never really becomes familiar. So he leaves the department resolved to pass on any orthodontic case he gets in private practice to X; this may be very lucrative for X, but is bad for the future of orthodontics.

Course of Instruction

The avowed object of the orthodontist is the controlled development of the masticatory face to the maximal degree of efficiency attainable. This is the highest expression of the purpose of the dental art. A course of lectures designed to show how this may be brought about and the difficulties encountered therein would seem to be the crux of the whole dental curriculum. Given a lecturer with the requisite breadth of understanding, such a course would bring about the effective correlation of all other courses (both pre-clinical and clinical) and give them their rightful setting. My plea, therefore, is that adequate prominence be given to the scheme of lectures as set out in the B.S.S.O. Report, that they be expounded and spread over a full year with a more leisurely and therefore more adequate treatment, and that they be treated with the care that is their due. I would go further in my desire to stimulate the interest of the student in normal and abnormal development. On entry to the hospital I should give into his care two children from an adjoining school whom he could see every term without treating. He could take impressions and make periodic study models, properly trimmed up. Seen first at say 7-8 years, and for the next 5 or 6 years, much would be learned. Dates of eruption would become living things instead of a mass of tables and the pegs would be provided on which many aspects of knowledge could be hung.

Homeostasis

Perhaps the student might ultimately be led to reflect on the observation of Cannon in his book, "The Wisdom of the Body," wherein he says :

"The numerous methods which throughout human history have been employed to cure disease, from beating a tom-tom to the royal

touch and the use of prayer, have all been justified by the fact that persons who were ill became well under the treatment. Only in recent times have any considerable number of persons been willing to test the efficacy of the natural processes alone and to observe that they are potent factors working for health." "What then is the use of the physician?" he asks. "In the first place the well-trained physician is acquainted with the possibilities and limitations of self-regulation and self-repair of the body. He is instructed in that knowledge and employs it not only for his own intelligent action but also as a means of encouragement for the patient who looks to him for counsel. The physician realises better than the layman that many of the remarkable capacities of the organism for self-adjustment require time."

Need for clinical judgment

It seems all too probable that there will be much delay in providing an adequacy of orthodontists whereby every child has a timely check of the critical stages in its facial development. The need for a realist understanding on the part of the general practitioner of what can and cannot be done in developing cases of malocclusion is thus of the greatest importance. With this it would seem that Professor Friel would disagree, since it might mean the perpetuation of the amateur orthodontist. Professor Friel is apparently prepared to leave only the essentially cosmetic device of straightening irregular incisors to the general practitioner, but nothing more.

What of course is frequently levelled by way of criticism at the specialist orthodontist is that he himself is mainly a cosmetician and that while his short-term results are apt to be both pleasing and spectacular the long-term results may leave a lot to be desired. Such statements as that of Harvey Ballard addressing the New York Society of Orthodontics, "If you get 50 per cent. of your cases to stay nice, you are doing wonderful work," are apt to be disturbing to the layman. What are the criteria by which the orthodontist judges the ultimate adequacy of his treatment? Too often one feels that static relationship of the jaws is over-emphasised and the very frequent photographs of occluded models tend to support this view. A non-traumatic balanced articulation would seem to me to be a better criterion and a peep at the lingual relationships of the posterior teeth would help in assessing this. Better still, the existence or absence of uniformly disposed multi-point contacts in lateral excursion as revealed by articulating paper would be more informative.

A system of orthodontia

Hunter (*B.D.J.* 1932), commenting on the various systems of orthodontia, says that each dental school has its own modification or method in its scheme of instruction and that from his point of view the result is chaos. He puts in a plea for a system that can be part of the average dental practice rather than the work of a specialist. In so far as this country can only boast six orthodontists (Friel) his plea is deserving of serious consideration, especially if we are to go on compromising with the situation as it is at present.

It is inevitable that any system will have its numerous exceptions and can never replace the insight arising from profound clinical study of the experienced clinician. Nevertheless, I should have felt that a simple usable diagnostic yard-stick might have been developed for the detection of abnormality. To give the practitioner the capacity to at least separate the sheep from the goats and thus avoid unnecessary intervention in cases that would in any event be self regulating, would be worth-while.

Gnathostatic approach

Much interest of recent years has centred around the gnathostatic approach to classification, and each proponent has his or her own base line. A critical analysis of the investigation into " Facial growth changes," by Miss Tildesley, in the report of the second International Orthodontic Congress, is a masterly if somewhat terrifying document. One point that interested me particularly was a statement of hers as to the best way of avoiding stumbling blocks and pitfalls in orthodontic enquiry. She says, " Engage the assistance of a pilot ! When the trained observer seeks the co-operation of the trained statistician in dealing with his data, the results are more likely to be valid and pregnant than if either works alone."

This may be true for the anthropoligist, but if these findings are to be made the basis of a yardstick for use by the clinician the dental investigator is under an obligation to simplify and interpret results. Take for instance the investigations into facial growth carried out by the committee on dental disease of the Medical Research Council. You may remember that two reports were issued embodying the work of Miss Smyth, Mrs. Johnson and Miss Still and Dr. Matthew Young. There are some most important observations contained therein of which everyone should know, but what heavy going they make in the form in which they were presented. Dr. Young perpetuates throughout the whole of the report a standard of measurement which I think is fallacious, and which adds materially to the complexity of the tables. I mean the habit of recording each measurement to 1/100 of a millimetre. From the clinical standpoint such a degree of supposed accuracy is unnecessary. A straightforward table of the principal measurements of the masticatory face, normal for a given age, and covering the critical years of growth, could be devised and be a great source of assistance to the practitioner. Such is the sort of yardstick that might be placed in the hands of the intelligent practitioner capable of carrying out simple measurements with simple apparatus. By coupling a system based on the external approach with a little guide such as the Korkhaus orthometer, an intriguing device for checking arch development, the practitioner would not feel quite so helpless as he does at present. To the uninitiated who cannot bring to bear wide clinical experience, great comfort arises from the ability to do something concrete in the way of measurement as an aid to diagnosis, and when experienced clinically he can always throw his crutches away.

Types and tendencies

If, of course, the work of Kretschmer on facial types means anything it is probable that the gnathostatic approach that ignores a preliminary analysing into types will only add to existing confusion. Of the three types defined by Kretschmer (1) leptosomic, (2) pyknic, and (3) athletic, it would seem that the leptosomic with the high narrow head with a peculiar angular profile which is partly the result of a protruding middle face and nose, and partly a retruding chin and forehead, is the group that the M.R.C. investigators have possibly unconsciously chosen for their study of post-normal occlusion. I note in the preface to their report the statement, " Corrective measures are said to be indicated in extreme cases not only for æsthetic reasons but also because of the supposed functional disability in mastication. In the children examined, however, such disability did not seem to have had a material effect upon general growth as those with *abnormal* occlusion were significantly *taller* than the normal."

What is highly significant too is that in fully 75 per cent of the boys and 50 per cent. of the girls examined the post-normal occlusion was due to an *excessive* forward growth of the upper jaw.

In view of Kretschmer's findings are the use of the terms " abnormal "

and " excessive " justified ? May not this be normal for the type ? What is normal for one type (the pyknic) may not be so for the leptosomic, and to decide that the leptosomic with his apparent post-normal occlusion must be translated into the neutrocclusion of the pyknic is pitting oneself against a genetic inheritance which is not likely to lead to success in our present state of knowledge.

Limitations of treatment

We have seen a possible limitation of treatment with the genetic factor dominating the scene and probably rendering any attempts to change the pattern of the individual null and void. This brings one to the general question of the failures and relapses about which too little is often heard. The student in particular should know of the work of Oppenheim, Ketcham, Gottleib, Schwartz and many others. What better way of driving home histology and pathology than to link it with clinical orthodontia. Let him see the long-term results of faulty treatment in the way of root resorption and the irreparable loss of alveolar bone that goes with rapid orthodontics, an admirer of which the student is apt to be.

Research

This brings me to my last point, the need for research. Its need is so obvious that no stressing of mine is called for. What a multitude of questions remain unanswered ! Wilkinson says that 90 per cent. of children have malocclusion. Pilbeam says 5 per cent. Such an apparently simple question as this remains unanswered. Let us see to it, then, that in the future school dental service an adequate opportunity is provided for answering some of these many questions. Given a service with a desirable degree of flexibility and scope for the enquiring mind there will be no lack of recruits keen to grapple with the many unknowns.

America is, I see, proposing to add to its existing research facilities, already generous in their extent by our standards, a National Institute of Dental Research. It will be interesting to see what place orthodontia takes in the new scheme of things.

Conclusion

You have listened most patiently to the wanderings of a layman in strange places, but it is a subject for which I have the greatest respect. Orthodontia demands big men to grapple with its problems, the complexity of which you all too clearly realise.

May I, in closing, commend to your attention an editorial in the *Dental Gazette* for August 1945, entitled " Orthodontics and the School Dental Service " :—

" The dental profession," it stated, " cannot be said to have shouldered its responsibilities so far as orthodontic treatment is concerned. Anyone who has practised the subject extensively soon comes to realise that mechanical skill and ingenuity is but a cog in the machinery of orthodontics and that a vast field of academic knowledge must be covered and acquired in order to appraise the cases with which one is constantly confronted." It goes on to say :

" The first decade must be experimental, it must concern itself with choosing the right men for its organisation, giving them freedom to experiment, for experiment we must." It further adds :—

" There is no doubt that when orthodontic treatment becomes more generally available it will enhance the status of dentistry to a high degree." With that one must heartily agree because any man or woman bringing to this task the breadth of knowledge and learning necessary to its successful solution can rightly claim to be a member of a learned company.

DISCUSSION

The President said he was sure all those present had enjoyed listening to the paper, which had given them a great deal of food for thought and discussion. The title of the paper was, in his opinion, a misnomer, as he thought the author had earned the right to be called at any rate an amateur orthodontist. He had noticed the discrepancies between the results of orthodontic treatment immediately on completion of the treatment and the results some years afterwards, and he had spoken about the long-term and short-term results with a very intimate knowledge of them.

He was very glad that the author had stressed the need for more orthodontists and the desirability of establishing a post-graduate orthodontic school. After the greatest upheaval in the history of the world, people were now ready for new ideas and a great deal of attention was being focused upon the young men who were coming out of the Forces and were seeking new avenues of service in public health and in private practice. Many of them were thinking about orthodontics, but there was not very much to offer them in the way of training.

Miss K. C. Smyth said she would like to thank the author very much for his paper and to say how much she admired his enthusiasm and the hard work that he had done in preparing his paper. He must have spent a great deal of time in reading treatises and other works, and if he had read the reports of the Dental Committee of the Medical Research Council she thought he had excelled in industry and perseverance.

The author had criticised the late Dr. Young for making his tables correct to 1/100 mm. It was a long time since she had looked at the reports in question, but she did not think that hundredths of millimetres were mentioned in the tables. Certainly the actual measurements were not taken and could not be taken to 1/100 mm.; they were correct to the nearest half-millimetre.

With regard to post-graduate education in orthodontics, all orthodontists were agreed that the need for education was pressing, and she would like to ask what was being done about it. Who were the people to make a move in the matter? As the author had said, money was required. Where was that to be sought? Who was to make the approach for the money that was necessary? Perhaps even more difficult to obtain than the money was the staff for the schools. The author suggested three post-graduate schools, but she thought that at least six were required and would soon be filled with students, but it would not be possible to staff them with people in this country. She did not think that even three schools could be so staffed, and it would be very difficult, as far as she could see, to staff even one efficiently. Could not the staffing of the post-graduate schools be made an attractive proposition to American orthodontists? It would be necessary to bring in all sorts of outside help. Pediatrics, general medicine, child welfare and child guidance, and many other subjects were concerned, and there would have to be a cosmopolitan staff in the post-graduate schools.

The author had referred to the desirability of watching the developments of the mouths of children without treatment over a number of years, and she thought that was a point which all the dental schools in this country could very well take to heart. Dental students from the very beginning of their studies should be able to watch the development of children's mouths. The first thing they were taught was to take impressions and make models, and, if they continued to do that with the same children at stated intervals throughout their career as students, by the end of their four, five or six years' training they would have gained a great deal of knowledge by watching the development of children's mouths, whether normal or abnormal, without treatment.

The author, in speaking of dentists referring cases to orthodontists,

said that that might be very lucrative for the orthodontists but very bad for the dentists, but she would point out that, although it might have been advantageous for the orthodontists in the old days, they were now so overburdened with patients that they were not grateful for new cases. There was a gross deficiency in the number of orthodontists and also in the number of general practitioners who were able to practise orthodontics.

She was aware of the fact that there was a very considerable disagreement at the moment on the question of the ability of general practitioners to practise orthodontics, but she could not see how it would be possible to go through the next five or ten years without the general practitioner taking his share in the orthodontic work which was crying out to be done. She felt that it was the duty of all orthodontic specialists and all those who had experience in orthodontia to help the general practitioners with whom they came into contact to recognise the cases at an early stage. Very many of them, as the author said, were allowed to go on until they were too old to receive the maximum benefit from treatment or, in some cases, any benefit at all. How were cases to be sent to orthodontists if the general practitioner was not able to recognise them? Surely orthodontists ought to hold out a helping hand and do what they could to assist the general practitioner, at any rate during the five or ten years, by the end of which time she hoped that many new members would have been recruited to the ranks of the specialists.

Mr. H. Chapman said that many of the members had seen numbers of patients from America in the last two or three years, as an extraordinary number of the children who had been evacuated from this country to America had received orthodontic treatment there. It had not been permissible to transmit money abroad, but he believed that a committee had been appointed by the Bank of England to supply extra funds for certain of the evacuees, and the bills for orthodontic treatment were amongst the largest of the bills that were paid.

The following were the instructions given to a child, just under 14 years of age, whom he had recently seen: "The upper retainer should be worn for three or four months; then it can be removed in the afternoons and worn only at night and in the mornings for another three or four months. Then it is to be worn at night until the wisdom teeth erupt." Then instructions were given about the lower retainer, which also was to be worn until the wisdom teeth began to erupt. Therefore, while orthodontics in this country might leave something to be desired, orthodontics elsewhere seemed to be in a similar position.

The complaint was made that there were not enough orthodontists, but neither were there enough general dentists, and that seemed to him to be just as great a difficulty.

He thought that the paper was most stimulating, and he congratulated the author on the wide vision that he had brought to bear on the subject.

Mr. J. Aitchison agreed with the author on the advisability of students having very young children allocated to them when they began their studies and their taking impressions and making models of the children's mouths repeatedly during the four or five years that they spent in hospital. If that were done, not only would the students get the benefit to which the author had referred but, when they were taking dental anatomy and studying the shortened enough views that were so prevalent just now (culminating in Dr. Negus's brilliant paper on the evolution of the speech organs), they would have constantly in mind the models they had made, and the hope expressed by Salzmann and others might be realised, i.e. that the orthodontist would in time

cease to be a rectifier of wrecks and become a pilot able to guide the jaws of the young child to the safe harbour of good functional jaws, instead of having to put in appliances to rectify them when it was in fact too late. He would certainly bear in mind the author's suggestion when he went north to the country from which he came and to which he repeatedly returned, and, when he visited his old dental school, he would have very great pleasure in conveying the suggestion to the orthodontist there, who he hoped would put it into operation.

He would like to thank the author for his very able paper, which he had greatly enjoyed.

Flying Officer J. Sturrock said he had enjoyed the paper very much and thought it was excellent ; in fact, he did not think there was any statement in it with which he disagreed.

A great deal was said to-day about post-graduate orthodontic teaching, but he thought there was something to be considered before that, namely, what was to be taught. He believed there were about six or eight orthodontic specialists in this country, and they did not all agree amongst themselves on what should be taught. He thought also that it was necessary to ascertain, by means of research work, what treatments were likely to yield a good result, and to advocate those only. The advisability of a great many of the procedures now adopted was open to doubt, and they certainly had not yet prov d their value. He thought that one of the reasons why there were eo few orthodontists was that a good many dentists, having done a certasn amount of orthodontic work, were discouraged by the long-term resulits they saw in their patients—not necessarily the results of their own treatment ; the treatment might have been given by specialists. The results at first might be good but after a few years they might not be so good, and when a dentist became busy he was inclined to spend his time on work that he knew was really serviceable, instead of spending it on certain orthodontic procedures which were of extremely doubtful value. He urged that before a post-graduate orthodontic school was started some effort should be made to determine what procedures should be advocated and taught therein. Perhaps a committee of the Society could be appointed for the purpose. Dentists knew the treatment for a carious tooth and they knew how to treat gum diseases with a fair assurance of obtaining a good result, but he doubted whether the same could be said in the case of orthodontic problems.

He thought that the author had got far enough away from the orthodontist's problems to view them in their proper perspective, and his paper was well worth a great deal of thought.

Miss L. M. Clinch said she would like to thank the author for his paper, which she had thoroughly enjoyed.

She thought that in orthodontic education, particularly undergraduate orthodontic education, too much emphasis was laid on technique and on the question of what appliances were the best to use for the purpose of moving the teeth. There were probably a dozen appliances which were equally effective in most orthodontic cases, but it did not matter what appliance was used if the diagnosis had been incorrect, and she thought that far too little stress was laid on the importance of diagnosis. The basis was diagnosis. The technique could be learned afterwards quite easily, but if students did not learn to diagnose cases they had no foundation. She thought the fact that too much emphasis was placed on technique and too little on diagnosis was partly what was wrong with orthodontics and was one reason why dentists were discouraged from taking up orthodontics as a career.

Mrs. Miller thought that all those who had enjoyed the author's paper would like to read a paper recently published in the *Proceedings of the Royal College of Medicine*, with regard to the work of a respiratory clinic in which the services of an orthodontist were utilised. She felt that much orthodontic treatment was unsuccessful because insufficient attention was paid to respiratory faults, and the paper to which she referred showed how closely the question of respiration was connected with orthodontic treatment.

Mr. H. G. Watkin said he would like to thank the author very much for his paper, which he had enjoyed very much and with which he was in complete agreement.

He would like to emphasise what Miss Clinch had said with regard to diagnosis. He was of the opinion that diagnosis was by far the most important matter and that the question of appliances was a secondary matter. He thought that orthodontists in general did not pay sufficient attention to the muscular actions on the teeth, particularly the action of the tongue. The mouth sometimes collapsed because there was not sufficient pressure outwards from the internal muscles of the mouth.

He entirely agreed with the author's suggestion with regard to serial models. On many occasions when patients were sent to him by other practitioners for diagnosis he took impressions and made models and told the patients he would like to see them again at intervals of six months, and in three or four years their mouths became normal without any treatment at all having been given. He agreed with the author that orthodontists should give Nature a chance and work with Nature and not against her.

In his lectures to dental students he always gave a short talk on fees and tried to make the students realise that they would pay super-tax if they became orthodontists, but, in spite of that, very few of them became sufficiently interested in the subject to take it up, and he did not know the reason for that.

Mr. H. C. Visick said he thought it would be very difficult to start an orthodontic post-graduate school where students were expected to be trained for a year or two years, but a post-graduate course in orthodontics, lasting about six weeks, could be started in connection with most of the dental schools, for graduates who did not intend to be specialists but who were interested in orthodontics. They should be taught in that course the rudiments of the treatment of orthodontic cases, because the ordinary practitioner was frequently faced with gross malformation in children, who would be ruined in appearance unless something was done for them. Until there were more orthodontic specialists the ordinary practitioner must treat such cases and wanted to do so, but he was afraid to start. If he took a short course in orthodontics and learned how to make a decent plate with wires, he could do a good deal to improve the appearance of many children, and that was what the layman wanted. The layman, in his own experience, wanted to see crooked front teeth put straight quickly and cheaply. He thought the short post-graduate course to which he had referred should be limited to dentists who had had at least two years in general practice, so that they knew the kind of cases they would have to treat; they would then take much more interest in the course and it would be of much greater help to them. He thought such courses could be given with the present staffs in the dental schools; there was usually one man on the staff who had specialised in orthodontics to a certain extent and could conduct the course.

Mr. B. Maxwell Stephens said that the paper certainly possessed the quality which Mr. Warwick James had once stressed as the most

important quality of any paper, namely, that it made people think.

As everyone present knew, there were only six or eight highly specialised orthodontists in this country, and they could not dispense help to more than a few of the most serious cases. All orthodontists had to gain sufficient knowledge to be preventive in their methods, and, when they had to deal with cases to which preventive measures had not been applied, they had to ask for help from one of the six or eight people who had greater knowledge than they themselves had, and who would very often indicate to them what not to do and whether there was any reason to expect that treatment would be successful. The third class of case was that which should be reserved for the orthodontic specialist and which the orthodontic specialist alone could rescue from the particular anomaly that existed in the patient's mouth.

Mr. R. V. Tait said he would like to thank the author for his very provocative paper and also to make a protest against too much emphasis being placed on the training of specialists to perform orthodontics. He thought that was quite satisfactory as a short-term policy, and the need for orthodontists was such that he supposed it was necessary to adopt some policy of that sort, but he felt that, taking a longer view, the dental profession should re-orientate its whole attitude towards dental education.

He had recently started to work in the school dental service; that was a quite new experience to him and one that he was enjoying very much. It seemed to him quite clear that the school dental service was the foundation of the dentally healthy nation that should be created. The general aim of dental education, as it was going all over the country at the moment, was to equip students for general practice or private practice, which meant predominantly the treatment of adults. He did not suggest that adults did not need treatment, but he suggested that, if a long-term view was taken, it was more important to train students for the school dental service, whatever form it might take in the future; he hoped it would be better in the future than it was at the moment. If the main educational aim was to be to train people for work in the school dental service, orthodontics would cease to be a specialist matter and would become one of the primary aims in teaching. Orthodontics might now be regarded as a subject of post-graduate study, but, if the longer view was taken, the desire would be to train all dentists to have a knowledge of the subject, which at the moment could be imparted only to a few.

Mr. R. Cutler said that the members had expected a good paper from Dr. Matthews and he had certainly fulfilled their expectations. He was one of those people who professed complete ignorance of a subject and then disclosed a battery of accurate knowledge with which he demolished those who were prepared to venture against him. He also enlivened his paper with little human touches, such as his suggestion that children from a neighbouring school should be examined one or twice a year. Personally he thought that was an extremely good suggestion, and it was little points like that which were often missed when large schemes were initiated.

He deprecated the wholesale approval of American methods, and he thought there might be some danger in importing some American technicians into this country, having regard to the entirely different conditions that existed here. He did not think that, because there were a thousand orthodontists in America for so many millions of people, that in itself was necessarily a good thing when compared with the relatively few in this country. The truth of the matter was that the vast bulk of the American orthodontists tended to overtreat a small privileged proportion of the population in America and that there were millions of unprivileged people there who received no dental

treatment whatever, whereas the aim in this country was entirely different, it being to give some measure of reasonably efficient treatment to everyone, and, quite frankly, he himself did not think that the number of orthodontists in America and in this country had any relative bearing at all.

He had seen some extraordinary things done by American orthodontists He remembered that at the beginning of the war, when this country was the spearhead of the defences, a well-known man in public life told him that his daughter was being evacuated to America, and some months later he showed him a box containing two pairs of models. One pair of models was a pair made of his daughter's mouth when she was about 12 years of age, and they showed gross overcrowding and consequent irregularity of the teeth. The second pair was a pair which had obviously been made by taking duplicate impressions of the original deformity, cutting all the teeth off the models and placing them in a regular arch, and there was a long letter from an American orthodontist, whose name was well known to everyone who knew anything at all about orthodontics and who frequently wrote articles in the American journals, setting out the result which he proposed to obtain in the case if he understood the treatment of it. He had obviously taken an immense amount of trouble in the matter. As the child was already in America, he did not make any very strong counter-suggestions when the child's father asked him for his opinion on the proposed treatment, though he was rather distressed by it. Six months ago he saw the girl, who was then aged 17, and found that the result of the treatment was terrible. The most charitable explanation was that the American orthodontist who had given the treatment thought that the patient belonged to the type to which many American children belonged ; it was a virile physical type, the children's fathers or grandfathers having originated from the tougher races in Central Europe. The orthodontist was probably quite unaware of the typical English jaws which were very often completely incapable of any stimulation and had treated the child in question on the lines on which he might have treated an American girl whose father and mother were Poles or Latvians, and on that account the treatment had proved disastrous. In America no great importance was attached to extraction, and that was probably right, because the children there were of a much more vigorous type, with jaws capable of much more stimulation, and therefore he did not think that American methods would be of much help in this country. To bring American orthodontists to this country as teachers would, he thought, be a great mistake, having regard to the problems that were peculiar to this country.

Dr. E. Matthews, in replying to the discussion, referred to Miss Smyth's remarks and confirmed the weakness of the report in its unnecessary complexity of measurement technique, and appealed for a rationalising of the findings. Much that was of value was hidden in a fog of figures. He felt that there ought to be professors of orthodontics in the dental schools if it were agreed that the problem of normal facial development is an important one. He did not think that orthodontists had striven sufficiently for an adequate recognition of the attainments of their art. He did not wish to over-emphasise the point, but there was not a single professor of orthodontics in the dental schools of this country although there were professors of prosthetics and operative dentistry.

He was a little troubled by Mr. Cutler's excessive insularity. He by no means agreed with all that the Americans said but they brought certain qualities to their work which he respected and with which he thought they might well infect Mr. Cutler. There was no suggestion that American orthodontists should be imported into this country.

even if they would come, but rather did he want to see Nuffield Fellowships won by young would-be orthodontists, so that they could go to America and see what was being done in that country, because there was much good work as well as bad. They might then return and energise the English system.

He agreed with Miss Clinch on the importance of diagnosis. If the uninitiated were given a little more help in the way of appliances for the detection of abnormality, the technique could be dealt with later.

With regard to serial models, he had never been so interested in orthodontics as when he began to take serial models of his own children. He had taken models every three months for several years and had learned a great deal from them. He was really intrigued by the stages of jaw growth seen. He thought it would be most valuable if students were to take serial models of children, but he would suggest that the students should not treat the children, because if they did they might become overburdened and lose their interest in the essential matter, which was to watch normal and abnormal jaw growth. The normal orthodontic viewpoint should be more forcibly emphasised in the dental schools, which should be made preventive-minded ; they would then re-orientate dental education and make it into a much sounder structure than it was at present.

On the motion of the President, a vote of thanks was accorded to Dr. Matthews for his paper, and the meeting then terminated.

Arrested Growth of the Jaws, Associated with a "Depressed Molar"

By H. C. VISICK, L.D.S.(Eng.).

I do not know whether other orthodontists have noticed an increase in the number of depressed teeth during the war. I have no statistics on the subject, but I am sure that I have seen many more during the war than I saw previously. Whether they have anything to do with the wartime diet I do not know. I think there has been an appreciable disturbance amongst teeth owing to the war, because I notice that many children are getting their teeth much more quickly than used to be the case. I have seen several children with their upper permanent canines halfway down at the age of 8 years.

Fig. 1 shows the models of a patient who, when she first came to me, was a fine well-built girl of 10 years 6 months. All the deciduous teeth had been shed and replaced by permanent teeth. The teeth were crowded in the incisor region. The occlusion on the right side was normal. On the left side the upper first molar appeared to be impacted against the distal side of the upper second premolar, and I thought that if I pushed it away it would come down, but it did not move at all. I realised then that it was a depressed tooth, the first I had noticed in the permanent dentition. Fourteen months of orthodontic pressure failed to produce any movement in the tooth.

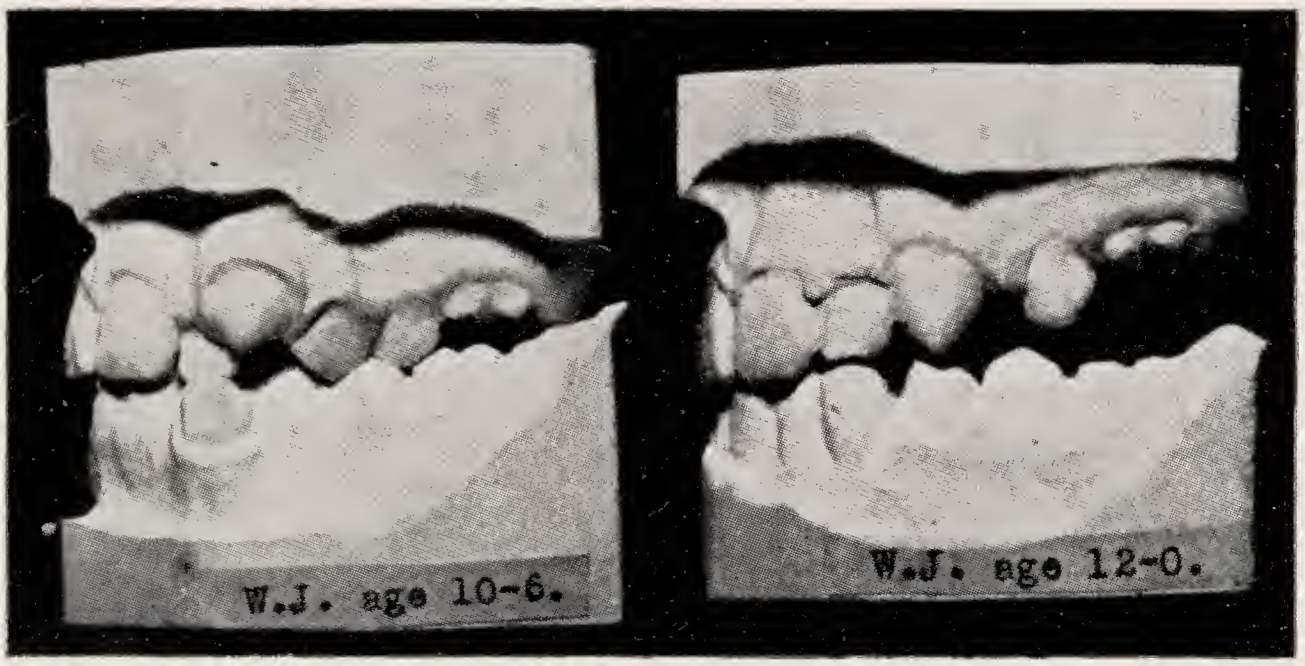

Fig. 1. **Fig. 2.**

Fig. 2 shows the state of the patient's mouth when she was 12 years of age. The space between the upper and lower first molars on the left side, which when I first saw the patient was about 2 mm., had increased to 12 mm., and she could put her little finger between the two teeth. The lower molar is apparently lower in its socket than it was before, the gum having risen around it. There is also a gap of 3 mm. between the second premolars.

When I saw the patient recently her mother said she noticed that the child's forehead appeared to be larger on the right side than on the left, and I noticed then that the whole of the head on the left side was smaller than on the right. Unfortunately I had no film, so I could not take a photograph of it. The mother told me that when the barber cut the child's hair he said it was much longer on the left side than it was on the right. I do not know whether that is what one would expect in the circumstances.

Is this a case of progressive atrophy of the bone ?

Another patient, who first came to me two years ago, had a right upper central shorter by 2 mm. than the left. I did not think much of it at the time, but when I saw him last week, after an interval of about a year, I found the upper central was very much shorter. When I tapped his teeth I got the ordinary soft note of percussion on all the teeth except the depressed one, which gave a different sound, as though it were a piece of rock. All incisor teeth were caries free.

Personally, I believe that these depressed teeth are ankylosed.

DISCUSSION

The President said that the matter brought forward by Mr. Visick was a very interesting one. It seemed to him that there was obviously some arrested growth. He would be glad to hear what other members had to say about it.

Mr. L. Russell Marsh said one very interesting point about the case described by Mr. Visick was that it showed the amazing amount of vertical growth that took place in the normal mouth in eighteen months. The suppression of teeth meant merely that they stayed behind, and it enabled one to measure that which it was impossible to measure in the normally developing mouth, namely, exactly how far the vertical growth had gone. He thought the case was one of arrested development.

Just before the war he had been shown similar cases at a meeting of the Society and had used them to demonstrate the fact that if a six-year-old molar was either suppressed or removed the growth on that side of the face was considerably less than the growth on the other side. That showed that the removal of teeth in fact caused the loss of a certain amount of growth of the jaws and therefore partly, at any rate, defeated the object the orthodontist had in view in extracting teeth, as the growth that was expected did not occur.

Mr. C. S. Morris said the interesting point about the case to him was that it was the first time he had seen arrested development in a permanent tooth, though he had seen many cases of arrested development in the deciduous dentition. It made him wonder whether orthodontists were right about the nature of the disease, if it were a disease.

Mr. H. G. Watkin said that the second case described by Mr. Visick reminded him of a parallel case which he had shown to the Society ten or twelve years ago. In that case it was the same tooth, the right upper central, that was depressed, and he thought it would be quite easy to pull it down. He banded it to about six or seven teeth for anchorage and put a spring on it to pull it down, but when the patient came back about two months later he found all the anchor teeth pushed up and the right upper central exactly where it was before. He then increased the pressure, but without effect. In the end he let the anchor teeth return to their former position and put a crown on the right upper central in order to make it longer. He thought Mr. Visick would have to treat the tooth in his case in the same way. If he remembered aright, when he showed his case he asked the members whether any of them had had a similar case and a few said they had, and that they had been unable to move the tooth. In his own case X-rays had shown that the tooth was normal both before and after he tried to move it.

With regard to the first case shown by Mr. Visick, he was inclined to think that it had something to do with the face not being sym-

metrical. He would like to know whether Mr. Visick had gone into the question of whether the child had any particular habits, such as biting a pencil on the left side of the face, to prevent the tooth erupting. If so the starting of a small space might allow the tongue to come out through the other space, and that would act as a constant buffer. In several cases he had found open-bite in the cheek teeth and if something was done to prevent the tongue expanding the arch the teeth came down in the normal way. He thought Mr. Visick's case was perhaps more difficult than that.

Mr. G. J. Parfitt asked whether Mr. Visick thought that in the case he had shown the mandible on the left side was normal and that the trouble was entirely due to lack of growth of the maxilla on that side. The fact that the whole of the child's face on the left side was small made him wonder whether the angle of the mandible and therefore the height of the condyle on that side were also small. He had seen several cases in which there had been over-growth of the condyle on one or the other side, and Mr. Martin Rushton had seen many more and had done a great deal of work on the growth of the condyle. He thought it was possible that the case shown by Mr. Visick was due to an over-growth of the condyle on the left side, which resulted in depressing the mandible and the occlusal plane of the mandible on that side. He would like to ask Mr. Visick, therefore, whether the mandible was smaller on the left side than it was on the right side. If so, he thought the lack of growth of the maxilla was even more marked than was suggested by the occlusion shown on the models.

Mrs. L. Lindsay said that some years ago a case very like the second one described by Mr. Visick had been reported in the *Dental Cosmos*. After several attempts to bring the tooth down it was removed by surgical means, and an inlay of bone was found just over the neck of the tooth, which was ankylosed into the alveolar bone. It was that which had prevented the tooth coming down, and the case described by Mr. Visick might be due to the same cause.

Mr. T. L. Winn said he would like to ask Mr. Visick whether it was clear that the case he had shown was due to atrophy on one side and not to over-growth on the other through some endocrine dyscrasia or something of that kind. He would also like to ask whether there was any asymmetry of any of the other bones of the body.

Mr. B. Maxwell Stephens thought the fact that the hair was longer on one side than the other showed some thyroid derangement. He had noticed that when he had very difficult teeth to remove from people who were very fat and flabby the alveolus was sometimes extraordinarily dense, and that had suggested to him a connection with endocrine trouble. That was a very nebulous hypothesis, but he thought it should be considered.

Mr. H. Chapman said he thought, from what Mr. Russell Marsh had said, that the case described by Mr. Visick raised the question whether teeth really made the jaws grow. Jaws which were entirely edentulous grew quite well, and he remembered that Professor Dixon, Professor of Anatomy at Trinity College, Dublin, said he did not believe that teeth caused the jaws to grow at all.

He was at a loss to make any suggestion with regard to the ætiology of the case, but surely the cause of the condition must be something quite local, as only one or two teeth were affected. If it were anything more general, such as endocrine disturbance, it would be likely to

affect more teeth. He wondered whether there might be some affection of the nerve which prevented proper development. If the case was one of atrophy, it seemed strange that the hair was longer on the left side ; one would have expected it to be longer on the other side.

With regard to the central incisor which was ankylosed, he would like to know whether Mr. Visick had it X-rayed and whether it had received any orthodontic treatment before Mr. Visick saw it.

Mr. Visick said he had not had the tooth X-rayed. It was already a little short when he saw the patient first, two years ago. It had not received any orthodontic treatment before that.

Mr. Chapman said that several years ago he had seen a child who had one central incisor very much shorter than its fellow, and in the previous three or four months that tooth had had orthodontic treatment. He had had it X-rayed and found that the root was very short. He had decided not to do anything about it, and the child was taken to a colleague who was a friend of his and who told him that he attempted to move the tooth and it moved the other teeth in the way mentioned by Mr. Watkin.

Mr. H. C. Visick, in replying to the discussion, said he was very grateful to the speakers for the suggestions they had made.

With regard to the question of habit, he had not found out whether there was any habit, but he did not think there was. The patient had lived in the country and he had seen her very seldom, and it was only on her last visit that her mother had drawn his attention to the dissimilarity in the size of the frontal lobes. The child had now been taken to a different part of the country, and he hoped she had fallen into the hands of a colleague who would carry on the investigation of her case.

In reply to Mr. Parfitt, he would say it was not obvious that the left side of the mandible was smaller than the right. He did not think that unless someone's attention was drawn to the fact that the child's head was smaller on the left side one would notice any difference at all, but when one looked carefully one could see a difference.

He did not agree with Mr. Chapman's suggestion that the cause of the condition was a local one. He had come to the conclusion that it was the jaws which were wrong, as the whole side of the face was affected. He thought the jaws and the bones generally were smaller on the left side.

Notes on GLOSSOPTOSIS AND MICROGNATHIA

P. G. CAPON, L.D.S.(L'pool.)

Hon. Surgeon-Dentist, Royal Liverpool Children's Hospital.

When, some twelve months ago, I was first encouraged to give you a communication on glossoptosis I had not given that thought and depth of enquiry, in choosing such a title, as I have now discovered was essential.

My interest had been aroused through seeing two babies at my hospital with marked cyanosis and difficulty in breathing apparently through some oral defect.

In both cases a diagnosis of glossoptosis was possible, the definition of which is that of the downward and backward displacement of the tongue, but it was natural that the possibility of an under-developed mandible being the mechanical cause of the tongue's displacement could not be excluded.

In so far as my judgment went, in neither case did I feel that either child had sufficient hypoplasia of the mandible to account for the condition. In spite of this I felt that such a diagnosis might be a very superficial one, and I therefore propose in this communication to give you the results of my thoughts and enquiries into other related possibilities.

I think you will appreciate the importance of the subject in our work because of its implications in the frequency with which we meet post-normal occlusion. I therefore suggest we continually bear this in mind in examining the gross cases I am presenting because some underlying facts may emerge which could be of vital physiological importance to the developing child.

It will be essential to include in the review the related condition of micrognathia or hypoplasia of the mandible—a highly likely syndrome. A congenital micrognathia has been already recognised and this deformity could mechanically displace the tongue backwards, but could a glossoptosis *per se* be a primary condition, and would it be feasible for a minor and therefore unrecognised backward position of the tongue, by the absence of stimulation, to discourage development of the mandible, and would this position interfere with normal physical development ?

Would the presence of a post-normal occlusion automatically produce a glossoptosis ? There have not been many writers who have described the clinical picture I am going to present but all, with one exception, have perhaps correctly diagnosed the condition as one of micrognathia or hypoplasia. The single author who has emphasised the position

Fig. 1. R. S. Male. 11 months.

of the tongue as being the primary cause, and the consequences that arise from it will be mentioned later.

I have tried to keep an open mind, and even now I am not satisfied that every case originated primarily in an under-development of the mandible. My opinion, with little material, and based on clinical examinations only, is that a hypoplasia might not be always sufficient to explain the effect.

Case 1. Only child. Parents healthy. No still births. No T.B. or rheumatism in family. Weight at full term $5\frac{1}{4}$ lb. Palate normal. Breast fed 3 months, then spoon fed. The clinical picture when first seen at 6 months was one of a child fighting for air. The mouth was hanging open, with the tongue filling the throat. Inspiratory stridor with indrawing of the supraclavicular fossæ and sternum. Movement of the left chest less than the right. Fingers and toes slightly longer than normal. Large low set ears. Left side of head flatter than right side. Note the straining cervical muscles.

Death at 13 months from pneumonia. Autopsy negative.

Fig. 2.

In Fig. 2 you will see that the mandible has been brought forward. The effect of this was to give immediate respiratory relief resulting in a very spectacular reduction of muscular strain. Later I will refer to other writers who have stated that when a micrognathia exists the lower anterior alveolar ridge may be more than 1 cm. distal to the upper. You will observe that I have produced practically a normal apposition by my action. It might be argued that the absence of any true joint and the laxity of the capsule may permit a very artificial approximation of the gum pads even in a marked micrognathia, when pressure is applied.

Miss Clinch (1932) describes her difficulty in judging how much force to apply in making a true diagnosis of post-normality in her observations on 500 infants. She states that the molar pad being higher than the remainder of the ridge it may act as a fulcrum, thereby disturbing the normal position of the joint.

Although in Fig. 2 I have used forward pressure only, we have to bear this in mind, and I suggest that the horizontal ramus appears to be in reasonable proportion to the upper jaw. It is, therefore, such an example as this which has made me speculate whether the position of the tongue alone could produce the clinical picture.

Case 2. Normal birth. Weight $7\frac{3}{4}$ lb. Weight at 5 weeks $7\frac{1}{4}$ lb. Weight at 2 months, 9 lb. One brother, age 8 years, with well-developed mandible, as have both parents. Breast fed from birth but milk going. General conditions: thin, pale. Tendency to finger clubbing. Soft palate cleft only. Has severe attacks of cyanosis which are overcome by turning face downwards.

Respiratory System. Forward protrusion of sternum, especially in inspiration with indrawing of lower ribs. Lower anterior alveolar ridge about half-inch distal to upper, but this can be easily corrected by gentle forward pressure when the mandible appears to be in proportion to the upper. Died at 4 months from bronchitis. Autopsy not possible.

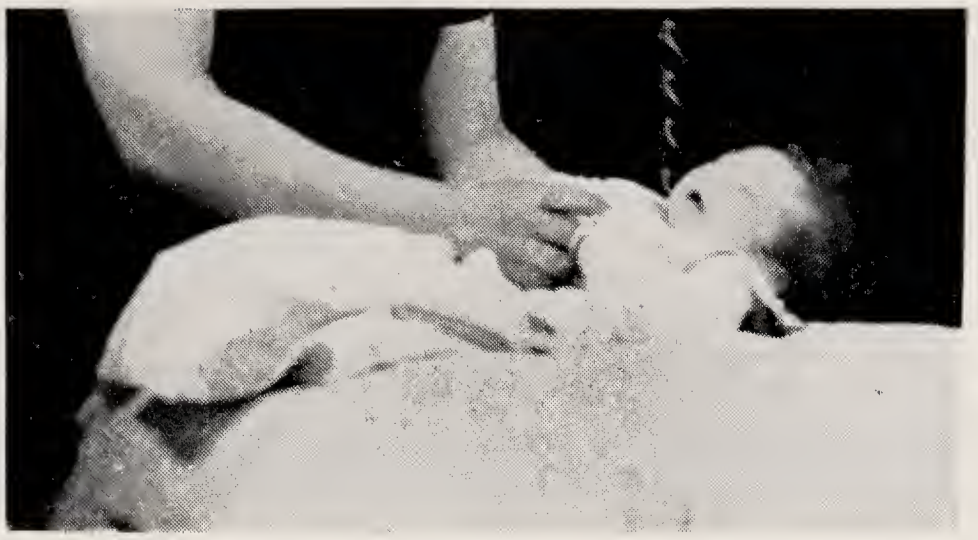

Fig. 3. K. N. M. Male. 3 months.

Fig. 4.
(After Robin.)

Fig. 4. Two illustrations used by Robin in his book "La Glossoptose." No case details are available, but note the emaciation.

Linking the conditions of micrognathia and glossoptosis together, similar cases to mine have been reported by Lapage (1937) one case, Davis and Dunn (1933) one case, Ely and Farber (1930) four cases. All these authors are of the opinion that the primary cause is one of a mandibular hypoplasia.

HEREDITY

In my two gross cases there was no evidence of hereditary influences.

In reporting his case—a twelfth child—Lapage suggests that the last three children had died from similar defects, and he thought it might have been due to the advancing age of the mother.

The other writers I have quoted make no reference to this defect being observed in the family—a fact I feel certain they would have done as it would be such a natural enquiry.

Pfaff (1913) showed that in fifty instances a micrognathic deformity was hereditary. It is, of course, a common experience in general practice to see the hereditary strain of a disto-occlusion running through a family.

In passing it is interesting to note that Retzius quoted by Keibel and Mall (1910) has given special attention to the time of occurrence of individuality, and he comes to the conclusion that in man it is recognisable even in the fourth month of intra-uterine life, and it becomes more marked in succeeding months.

EMBRYOLOGY

It appears that cleft of the soft palate only is an extremely commonly associated defect, and with the exception of one of my cases all those reported have been so affected. The presence of this associated defect

lends substance to the theory supported by other writers that pressure interference with growth may account for a micrognathia.

To explain this, Davis and Dunn (1933) say : " The lower jaw, being formed and united in advance of the upper, acts as a matrix on which the upper jaw is formed. Considering the position of the child in utero, where the weight of the entire fœtal body may be readily thrown on the vertex, it is easy to conceive how pressure of the sternal region in contact with the mandible might force the forming jaws together. If this undue force occurred at a time when the lower jaw was united and the upper jaw ununited, it is easy to understand how pressure on the chin could force the partly calcified lower jaw backward, straighten the obtuse angle to almost a right angle and prevent the union of the horizontal plates, causing a cleft in the soft tissues of the palate without involvement of the alveolar ridge or lip. It would also account for the backward displacement and small size of the tongue."

This theory did not seem to me to be a very practical one because actual continuous obstruction to growth over a considerable time would be necessary, and it appeared to me that as the fœtus is continually moving whilst lying in the amniotic fluid interference would not be possible. On this question being put to Miles H. Philips, Professor Emeritus of Gynæcology and Obstetrics, Sheffield University, he replied " The condition described cannot be due to intra-uterine pressure, but that on the other hand there are reasons for believing that it is ever so much more likely to be of hereditary origin."

To support their argument Davis and Dunn quote Keibel and Mall, who state that " At the first half of the third month the lips project equally. Later the border of the upper lip and the lip itself grow more rapidly so that in the fourth and fifth months it projects markedly beyond the lower lip."

They continue : " By a stronger growth of the lower jaw and lip this difference is gradually overcome in the sixth to the ninth month, but by a kind of inhibition process early fœtal arrangement may be retained in the adult to a marked degree."

It is interesting to study Miss Clinch's (1940) X-rays of fœtal jaws from the Royal College of Surgeons covering the fifty-six day to six month period. She remarks on the more rapid development of the upper jaw which is counteracted by the speeding up of mandibular development in later fœtal life, but she admits the evidence is not conclusive. Further to this Miss Clinch (1932) has studied the relationship of the gum pads in the new born in a remarkable research on 500 infants. In it she was satisfied that out of a total of 400 cases 27 per cent had a slight distal displacement of the mandible with a physical appearance of mandibular retrusion and 3 per cent had a gross displacement. Of the latter which she classified as Type 3 she states that, " You will note the possibility of a clinical picture capable of being classified as a micrognathia." And she continues : " In these cases the lower jaw is smaller over its entire area than the upper, and seems to fit up into the palate so that no space is possible anywhere, as the upper segments everywhere overhang the lower. The tongue is very small and lies pressed up against the hard palate, very distal to its position in Types 1 and 2."

However, in both my cases the lower arch was of good width and in keeping with the upper gum pads.

Some writers have mentioned the presence of a small tongue. From my limited experience this does not seem so. I considered in my two cases that the tongue was normal in size, but that from its cramped position it actually appeared larger than normal. I had taken particular notice of this because the loss of control of the tongue might be due to some paresis, and if this were so I would expect some evidence of atrophy of the organ.

In passing, I have always had difficulty in keeping the field clear of the tongue in any dental operation in a post-normal occlusion case. This, I believe, is either due to the normal tongue having insufficient room or to the mandible being retracted on the neck when the mouth is open.

It would be a natural enquiry whether any interference with the direction of ossification either by pressure, or from inherent influences could cause distortion in growth particularly at the condyle.

Wilson Charles (1934) has demonstrated that after the 50 mm. stage, evidence of condylar growth appears in the form of cartilage cells which are rapidly converted into bone. He states that although the mandible is a membrane bone where more rapid growth is required, the intermediate cartilaginous stage occurs and that the upward growth of the body of the bone enveloping the growing condylar part determines the development of the mandible in two directions where the length of the ascending ramus is concerned. Therefore, the theory that a sharper angle is noticed in a micrognathic mandible might be possible if it were proved that pressure was the cause. However, I believe that in the post normal child the angle is more obtuse, which I put down to the associated absence of vertical growth. Unfortunately, because of the war, I was unable to get any measurements of my two cases. It is interesting to note that Dolamore (1923) in a paper on inferior retrusion before this Society, asserted for the purpose of discussion that there is usually no diminution in size in the mandible, and that if this were so then the malformation must arise in malformation or variation in the articular surfaces of the tempero-mandibular joint.

Cale Matthews (1929), in a paper given before this Society, touched on the various hypotheses which might produce post-normal occlusion, including modern conditions of living, artificial feeding, speech and heredity, but he also asked whether it was entirely due to lack of development of the mandible.

PHYSIOLOGICAL EFFECTS

It is obvious that either a small mandible or a displaced normal mandible or a backward falling of the tongue could cause a partial blockage of the airway. The clinical picture of this may be a serious cyanosis with a deformed chest, falling in of a supra clavicular fossæ and a labouring diaphragm, all these asphyxial symptoms being miraculously cured by a slight forward finger pressure behind the angles. On the supposition that many infants and children have this defect in varying severity Robin (1926) covered the implications very thoroughly. He states that in addition to the full demands of the lungs being interfered with in all varied conditions, actual pressure of the tongue on the glosso pharyngeal, vagus, spinal accessory and

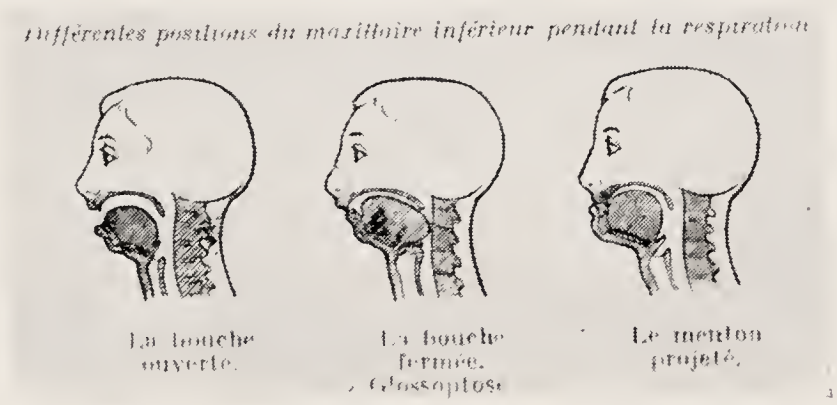

Fig. 5.
(After Robin.)

hypoglossal nerves, the internal carotid artery and jugular vein takes place with reflected disturbances in the sympathetic and vegetative systems. (Fig. 5.)

He also stresses the pathologic and pathogenic harm arising from failure to warm and filter the air through the nasal airway (Fig. 6). Both the gross cases I have shown died of broncho pneumonia and the majority of the cases reported by others were lost from respiratory infection.

Robin (1934) has stated that if the mandible is further than 1 cm. behind the maxilla the case will not survive 18 months.

Cutler (1931) in an able paper on "Post-normal Occlusion as a Manifestation of the Lymphatic State" opened a line of thought concerning physiological well-being and dental deformity.

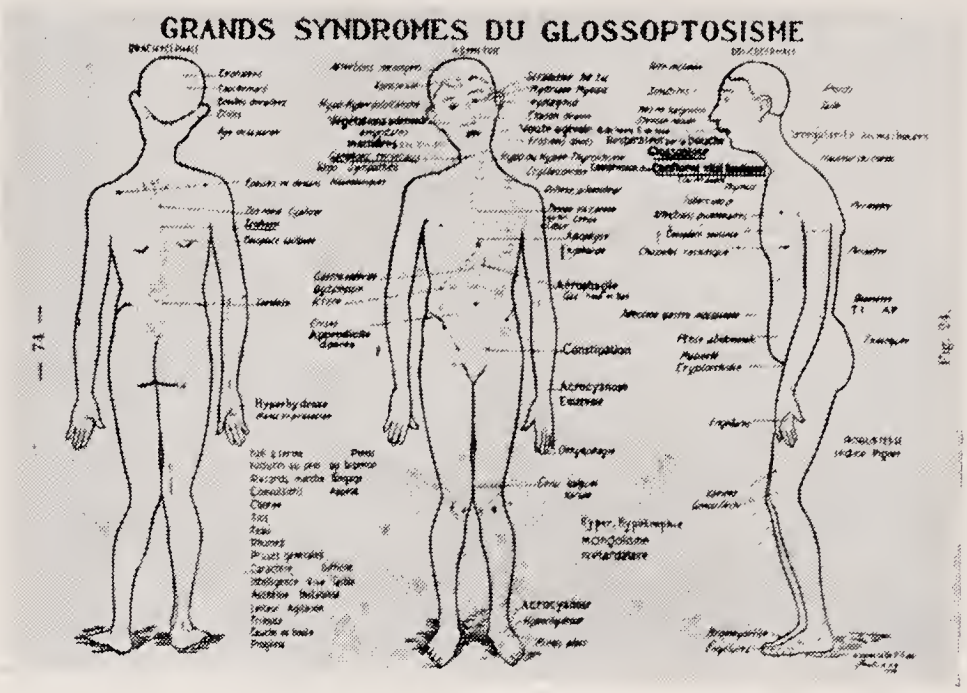

Fig. 6. (After Robin.)

Some of his illustrations suggest the presence of glossoptosis and also many of the symptoms mentioned by Robin. His observations are refreshing because we tend to take too restricted a viewpoint of our sphere of work, but he states "that mouth breathing alone as the main cause of this specific deformity is an outworn shibboleth : it is a played-out hack."

I should like to suggest that air starvation may help to account for the syndrome he describes. He quotes Layton as suggesting that adenoids by initiating mouth breathing cause the deformity. However, Cale Matthews (1929) has asked the question whether nasal stenosis is the cause of post-normal occlusion or the sequel.

The description of mouth breathing is a misleading one. I suggest that true mouth breathing is never seen. What is implied by the term is the appearance of parted lips and sagging mouth. I admit that some air may be taken through the mouth but this position is really one of comfort. I suggest that by relaxation of the oral tissue there is a greater freedom for combined nasal and oral breathing.

The question of air hunger to the growing child is a vital one. An insufficiency of oxygen, poor aeration, and poor elimination of CO_2 will cause a swing to the acid side, and thus produce serious physiological consequences.

Robin states (1926) that he has never seen adenoids without glossoptosis, but he has at times seen glossoptosis without adenoids. Clinically, his argument fits in so frequently with my own experience in the so-called adenoid child, who on being referred to the E.N.T. specialist is found to have little or no nasal obstruction. If there is anything in these arguments are we justified in our disto-occlusion cases in improving the appearance only by extraction of the first bicuspids and retraction of the anterior teeth ? (Figs 7 and 8).

Fig. 7.

Fig. 8.

Master McA. Bilateral disto occlusion.

Fig. 7. Completion of treatment following extraction of $\frac{4|4}{}$ and retraction followed by inclined plane plate to encourage the opening of the bite. Note the way the patient prefers to sink the mandible into the neck. It would appear that treatment was for æsthetic reasons only and without physiological benefit.

Fig. 8. Models of completed treatment. This patient at $13\frac{1}{2}$ is very small and under weight for age. His younger brother age $10\frac{1}{2}$ with normal occlusion is the same size. Both parents are very tall.

TREATMENT

In the infant this turns on an endeavour firstly to obtain normal respiration and secondly on stimulating normal development and function. I have stated that simple digital pressure behind the angles or even placing face downwards will give immediate relief, but to do this by an appliance is extremely difficult.

In Case 1, I experimented with a plaster head cap carrying brackets and adjustable pads to the distal borders of the ascending rami. This failed because the head movements could not be restricted and the pads slipped. I then found that Ely and Farber (1930) had devised a skull cap carrying rubber shod wire passing behind the ascending rami and tied under the jaw. Here again to obtain sufficient force was almost impossible and again the child displaced it. Lapage also reported a failure. I then tried the use of an artificial teat.

In Case 1, the position of the mandible and the wide open mouth made the exertion of retaining the teat too great.

In Case 2, I had considerable success.

I also found that a sitting-up position helped a little. All writers have stressed the fact that the main effort must be to encourage a forward thrust of the mandible and thereby stimulate growth. For many years I have thought that the considerable exertion entailed in breast feeding must be an important growth factor as the effort is performed by a forward and upward pressure only of the mandible.

Cale Matthews (1929) gives a sound description of the benefits of breast feeding and he stresses the extraordinary muscular force needed to express the milk. Unfortunately, the quantity of milk falls off unless there is a demand and this may happen with a micrognathic baby.

I have also always thought that the vertical position for feeding for all infants would have the advantage of making the jaw project, and I have found that Robin and others have advocated this orthostatic feeding.

It has been pointed out by Davis and Dunn (1933) that the weight of a heavy breast pressed against the face when the child is lying down, will discourage the forward movement of the mandible.

Considering artificial feeding I found that my Case 2 (Fig. 9) took the bottle easier when upright. Later I found that Davis and Dunn had devised a bottle carrying a sliding bar and pad. By adjustment according to age this pad is so adapted that it is pressed against the upper lip. It is therefore necessary for the child to strain the mandible forwards to grasp the nipple (Fig. 10).

Fig. 9.

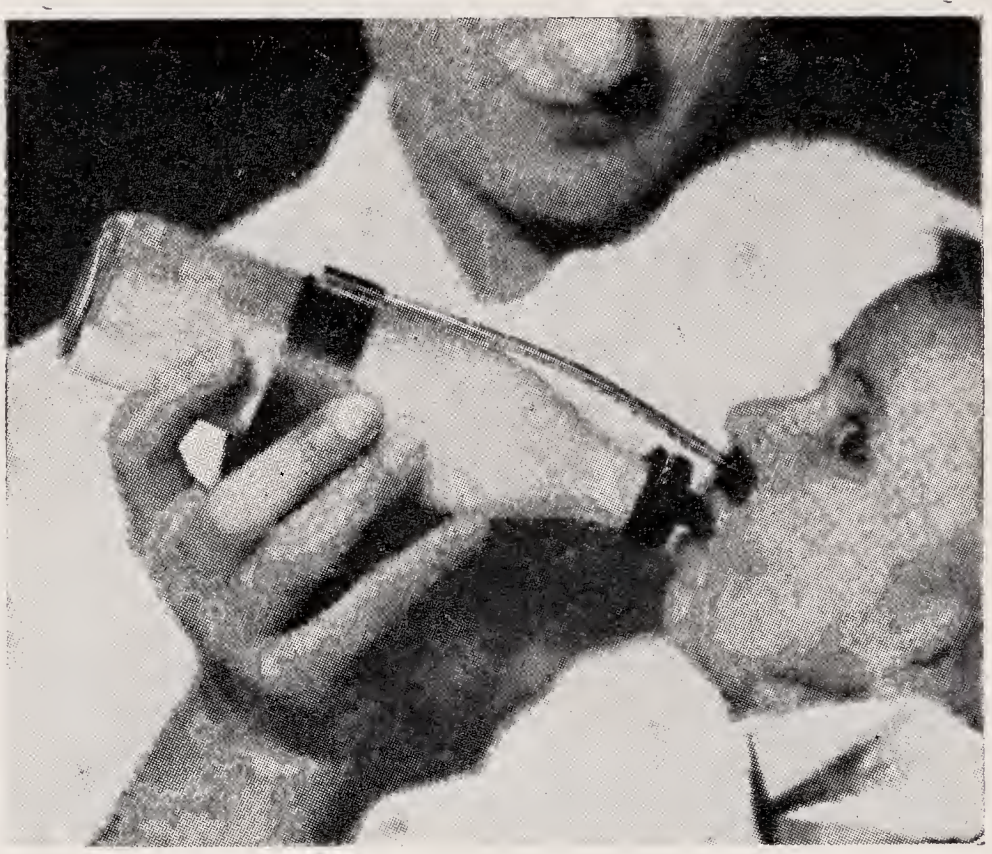

Fig. 10. (After Davis and Dunn.)

As we, in our practices, have no opportunity to see these gross cases the points I have discussed are unfortunately of scientific interest only. This is regrettable.

CONCLUSIONS

It is Robins's view that many children and adults show some evidence of the syndrome I have described. It is easy to labour a theory but if we reflect on our practices, there may be many who will agree with him.

There may be hereditary and other influences over which we have little or no control, but Cale Mathews has aptly stated that " although heredity may be the great factor in post-normal occlusion are we to assume it is consequently untreatable ? "

There are many questions in my mind. Is it possible that our patients consult us too late to be of any physical benefit to them ? Should we treat cases much earlier than is customary ? Should we

use intermaxillary traction more often than we do rather than depend on extraction and retraction? Do we appreciate the physiological benefits of the oral screen? Should we speak with authority on infant feeding?

You will see that there is much room for research into the effects of oral deformity and metabolism. My own conclusions are that a glossoptotic condition, even without a marked micrognathia is more prevalent than is realised. Health and freedom from much oral disease and a satisfactory combustion of food depends on a functional airway. How many think of life in terms of dietetics only?

In conclusion, I wish to offer my thanks for assistance and advice to my brother N. B. Capon, Professor of Child Health, Liverpool University, A. Leyland Robinson, Professor of Gynæcology and Obstetrics, Liverpool University, and Mrs. Lindsay.

(It has been necessary to condense this communication and to remove some of the illustrations because of the restrictions in the use of paper.)

REFERENCES.

Cutler, R. (1931.) *Trans.* B.S.S.O.
Charles S. Wilson. (1934.) *Trans.* B.S.S.O.
Clinch, Lilah. (1940.) *Dental Record*, Vol. LX. No. 8.
Clinch, Lilah. (1932.) *Trans.* B.S.S.O.
Davis, A. D. & Dunn, R. (1933.) *Am. Jour. Diseases of Child.* Vol. 45.
Dolamore, W. H. (1923.) *Trans.* B.S.S.O.
Ely R. C. & Farber, S. (1930.) *Am. Jour. Diseases of Child.* Vol. 39.
Keibel, F. & Mall, F. B. (1910.) *Manual of Human Embryology*, Philadelphia. Vol. 11
Lapage, C. Paget. (1937.) *Lancet*, February 6th, 1937. Page 323.
Matthews, G. F. Cale. (1929.) *Trans.* B.S.S.O.
Pfaff, H. W. (1913.) Quoted in Bruning and Schwalber, *Handbuck der Pathologiedes Kindesalters, Munich.* Vol. 11.
Robin, P. (1926.) *La Glossoptose*, G. Doin & Cie, Paris.
Robin, P. (1934.) *Am. Jour. Diseases of Child.* Vol. 48.

DISCUSSION

The President said he was sure that Mr. Capon had put a great deal of research into his paper, which, as it had developed, had shown that the subject with which it dealt had a greater bearing on orthodontic problems than appeared at first. He thought that if orthodontist paid more attention to the question of respiration they would be able to solve many of their problems in other ways than by mechanical means, and they would find this new field a very interesting one.

Mr. C. F. Ballard said he would like to thank Mr. Capon for bringing forward a very interesting subject. A paper had recently been read before the Ear, Nose and Throat Section of the Royal Society of Medicine by a team of workers at the Willesden General Hospital who had been studying the upper respiratory tract in children and had come to some conclusions which they admitted were not very definite, because they had not dealt with enough cases, but which he thought bore on what Mr. Capon had said. These workers selected children in the ear, nose and throat clinic of the hospital in whom they thought there was quite definitely an abnormality in tongue position which showed that the tongue was not fitting the roof of the mouth correctly, and they also made the diagnosis that the hyoid bone and the whole of the muscle hammock which supported the tongue were lower down than was normally the case, in other words, they diagnosed glossoptosis, and the orthodontist diagnosed post-normal occlusion in the majority of the cases. They worked as a team in their treatment. The speech therapist gave the children breathing exercises and tongue exercises. He was not sure whether the orthodontist treated the post-normal occlusion, but he put in a tongue-raising appliance. The result of the combined treatment was a great improvement in the general health of the children and a great improvement also in the

condition of the lymphoid ring of tissue of the pharynx, and the ear, nose and throat specialist showed radiologically that the muscle hammock sling which supported the tongue and the hyoid bone were at a higher level in the treated cases. Personally he thought that work was a valuable contribution to the study of glossoptosis.

Another point which had a bearing on the subject was that the speech therapist frequently gave a diagnosis, in cases of glossoptosis, of incoordination of tongue action, which might be a neuromuscular incoordination. He thought that abnormal positions of the tongue could be due to some neurological cause rather than to a lack of development of the mandible.

Mrs. L. Lindsay said it had struck her that the Hapsburg jaw was responsible for the nasal obstruction in question. There was evidence that the children of the Hapsburgs for many generations had suffered from adenoids and some of them had actually open mouths. She had studied a good many of them and she thought that the growth of the lower jaw was due to the stimulation of the condyle by its being perpetually thrust forward to relieve the respiratory obstruction. She would like to know what Mr. Capon thought of that idea.

Miss L. M. Clinch said Mr. Capon had asked whether orthodontists should extract premolars less frequently than they did and use intermaxillary traction more often, and her reply to that was in the affirmative. She thought that before they extracted upper premolars they should consider what effect it would have on the patient's respiration. After intermaxillary traction had been worn for three or four months she was often amazed at the improvement on the health of the patient. The extraction of premolars might be the easiest course for the orthodontologist to adopt, but in the end it might not be the best for the patient.

Mr. R. Cutler said that in the paper which he had read before the Society some years ago and to which Mr. Capon had referred he had drawn attention to an association between post-normality and a distinct diathesis, and he was still firmly convinced of the existence of that association. He would draw attention, however, to the fact that the lymphatic diathesis was seen as a recognisable entity only when the person who had it was subjected to a faulty diet, such as the very high carbohydrate diet of the lower classes before the war, which produced a very obvious waterlogging of the tissues. It had been found at Guy's Hospital at that time that amongst the cases showing gross waterlogging of the tissues the proportion of cases with post-normal occlusion was very high indeed. The carbohydrate diet of children of the upper classes had not usually been such a heavy one, the children of the lymphatic type had not been so easily noticed or diagnosed. There was no doubt at all that many cases of post-normal occlusion were also associated with gross postural defect, but he did not know which came first.

One clinical observation which he would like to mention, but which might be rebutted, was that people with very gross untreated or unsuccessfully treated Class II, division 1, deformities appeared to suffer not only from a cheer mechanical inefficiency of the biting mechanism but also difficulty in performing the swallowing movements whereby they disposed of their food. A further interesting observation he had made was that people with very marked deformities of that type had great difficulty in swallowing pills! He thought that had some bearing on the question of the control of the tongue.

Mr. P. G. Capon, in reply, said it was evident that the position of the tongue could have a considerable bearing on the well-being of the individual.

With regard to the question of diet, to which Mr. Cutler had referred, the point was whether any individual could make use of any diet, whatever it might be, if he had not enough air for the combustion of the food. If a child could be given a better chance of life by the mandible being brought forward, that was the treatment which should be adopted, and the case should not be dealt with solely from the æsthetic standpoint. Many parents were more concerned with the appearance of the child than with the question whether the child would be healthier as the result of orthodontic treatment.

Unusual Variation in Identical Twins and its Etiology

By W. TREVOR JOHNSON, L.D.S.(Eng.).

I have brought along tonight slides of three sets of models taken at 8 years 7 months, 11 years 11 months and 13 years 9 months of female identical twins, and you will note there is remarkable similarity in the arrangement of the teeth in the mandible and marked differences in the maxilla. There is a difference in rugæ outline ; there is rotation of the upper first permanent molars in one child and not in the other ; and there is a difference in localisation of deficient vertical alveolar growth in the two children, this condition existing in both children in the lower left second deciduous molar area, and in one child only in the upper left second deciduous molar area. I believe the etiology of the deficiency in vertical growth and the differences in the twins is of interest to us.

The first sign of the deficiency generally is a space between the tooth or teeth in the area to be first affected and the opposing tooth or teeth and the condition may remain localised or may spread and become unilateral in one or both jaws or bilateral in one or both jaws. The difference in height between the occlusal surfaces of affected and unaffected teeth is frequently very considerable and the length of time over which the deficiency in growth operates may be concerned in this.

In a recent paper, Mr. Capon referred to many cases, which included five families with two or more children affected and I know of one other family of four children, two of them female identical twins, with the deformity, and the other two, males, unaffected.

I submit that the delayed manifestation and the limited area sometimes involved is behaviour more in harmony with a disturbance of genetic origin than any nurtural influence, such as early injury to the ovum, food deficiencies or, say, an acquired endochrine imbalance any of which would be likely to affect larger areas. There is, however, no evidence of the condition of localised deficiency having been found in parent and offspring. This seems an important link missing but I think a satisfactory explanation is offered to us by the geneticist. The Chromosome theory of inheritance assumes the existence in the germinal material of factors, or genes, which in their action determine the future characterisation of the individual and control the development of the organs and the tissues. The size characters of the body are said to be based on several pairs of genes and it seems reasonable to assume there may be a combination of genes which refer to normal growth, and, in regard to alveolar growth in particular, a main gene interacting with secondary genes which refer to deficient vertical growth. But these harmful genes are " recessive " and the combination leading to the deficiency very rarely occurs and although factors for the deficiency are passed on from generation to generation, the character of the deficiency is very rarely displayed. The age of onset of the disturbance and the length of time it operates, is also likely to be the work of genes.

Mr. Capon raised the question of common hereditary factors operating in this localised deficiency and the condition commonly known as " close bite." Friel and McKeag found from clinical observation it likely that close bite is not one condition but can be divided into at least three of widely different characteristics, apart from the overlap of the incisors. There is an inclination to regard close bite as either excessive vertical growth in the region of the incisors and canines or deficiency in the cheek teeth areas, but this is evidently not the whole story. If we accept Wilson Charles's findings on the growth of the

mandible, deficiency in condylar growth may be one of the important factors. Close bite differs in being always bilateral with all the cheek teeth involved ; in being more definitely foreshadowed in the deciduous dentition ; and in being frequently found in parent and offspring. It is likely that many more areas are involved in close bite than in the localised deficiency and perhaps environment makes a larger contribution. Nevertheless heredity is probably the dominant factor in both conditions.

I found the differences in the twins difficult to explain in the light of my theory of heredity as the main factor, but the geneticist can again assist us. As with all inherited characteristics, alveolar growth, whether normal or abnormal, is subject to environmental influences, and the extent to which the deficiency is due to secondary gene influences on the one hand, and to environmental influences on the other, is difficult to establish. I understand that differences of at least the same degree as found in the present twins are found within a single family of pure bred fruit flies, and that whilst comparison between widely different organisms is difficult, such a line of pure bred flies possesses approximately the identity of genetic constitution found in identical twins. It is well known that though variation in identical twins is greatly reduced, it is not abolished. So the differences in the maxilla in the twins is explained by assuming that each twin possesses an identical combination of genes for normal growth and for deficient growth, which interact, and are influenced by environment which has varied in amount and kind in the two individuals.

To apply this theory to a common form of malocclusion we can take a hypothetical case of identical twins with a combination of genes for normal arch relationship interacting with genes for post normal arch relationship. Environmental influences such as finger or thumb sucking might operate in one twin and a post normal arch relationship ensue, whilst the twin with no such habit would be normal. But this is highly speculative and we have no evidence that this habit results in more than a localised change in shape of the arches. In fact it is maintained that the inherited patterns of growth are very strongly protected against changes by environment ; also there are in an individual some inherited characteristics which are more tolerant to changes by the interaction of nature and nurture than others. As an example it is possible that width of arches is more likely to be influenced by nurture than is arch relationship antero-posteriorly.

It should be stated that there is no history of other instances of the localised deficiency in the family from which these illustrations are taken or any evidence that either twin has been exposed to any major environmental influence likely to introduce a factor in development of the deficiency or explain the differences. The twins were first seen by the writer at 11 years 11 months.

Fig. 1 is a morsal view of the models of the twins taken at 11 years 11 months. It will be convenient to refer to the twin with the deficiency in the mandible only as " Twin 1 " and the other with the deficiency in both jaws as " Twin 2."

The main differences are the variation in localisation of the deficiency in the two twins ; the marked rotation of 6 | 6 in " Twin 1 " ; and the absence of the rotation in " Twin 2." This rotation must be influenced by some environmental factor not operating in " Twin 2." It should be noted that ED | in " Twin 2 " were extracted before 8 years 3 months and that this is followed by no rotation or medial movement of 6 | . Similarity is most marked in the slight imbrication of the lower anterior teeth, which might be said to be identical.

Fig. 2 is a morsal view of the upper models taken at 13 years 9 months with the rugæ outlined. The patterns cannot be regarded as

Fig. 1.

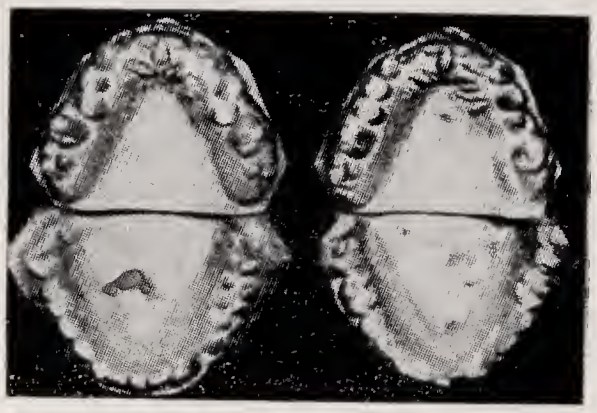

Fig. 2.

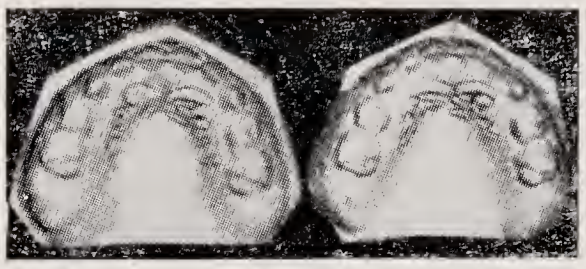

Fig. 3.

similar, but the differences are certainly less than in a case of male identical twins with arch shape and arrangement of teeth apparently identical (see Fig. 3).

Fig. 3 is a morsal view of the upper models of these male identical twins at 5 years 10 months. One has extensive caries and the other is caries free.

I understand that the rugæ pattern in man is not in any degree a reflection of the pattern of the underlying bone as is the case in some animals.

Fig. 4.

g. 5.

Fig. 6.

Fig. 7.

Figs. 4 to 7 are of right and left views of the three sets of models of both twins at 8 years 3 months, 11 years 11 months and 13 years 9 months.

Fig. 4 is " Twin 1 " left lateral view.

Fig. 5 is " Twin 2 " left lateral view.

Fig. 6 is " Twin 1 " right lateral view.

Fig. 7 is " Twin 2 " right lateral view. The top and bottom sets of models should be transposed.

$\overline{|E}$ was exfoliated in "Twin 1" a few days before impressions at 11 years 11 months were taken and in "Twin 2" a month or two earlier. It has been stated on the evidence of earlier reported cases that "Where the deciduous teeth are exfoliated or extracted at about the normal time, no complications have occurred." In the twins exfoliation in the affected areas was delayed and in view of the very slight improvement shown in the condition at 13 years 9 months it is unlikely that the teeth in the area will now meet in occlusion. It is however improbable that prolonged retention of the deciduous teeth is the main factor concerned in the continued deficiency in development, but rather that the gene or genes referring to the deficiency have continued to operate until a later stage. More case histories and serial models will be required to elucidate this.

In conclusion, I should like to record my thanks to Prof. John E. Harris for his help in the preparation of parts of this paper.

REFERENCES.

Capon, P. G. "Localised Vertical Growth Disturbance." *Trans. B.S.S.O.* 1942-3.
Charles, S. Wilson. "Development of the Jaws." *Trans. B.S.S.O.* 1935.
Friel, Sheldon and McKeag, H. T. "Investigation into the Nature of Close Bite." *Trans. B.S.S.O.* 1933.

DISCUSSION

Mr. H. Chapman said it was remarkable that the meeting that evening had before it two cases, one showing lack of occlusion of molars in the permanent dentition and the other showing lack of occlusion of premolars. It would appear that such cases were not as rare as they were thought to be and that, like so many other things, when one began to notice them one found them more frequently.

He had brought with him the models of two girls who were identical twins and whose jaws were very similar and showed a typical Class II, division 2, condition, although the lower arches were very much smaller and far more crowded than the upper ones. In one case the permanent right lateral was in contact with the first deciduous molar in the lower jaw, and in the other case there was the same contact on the left side. The two cases had other features in common which appeared on the right side in one case and on the left side in the other.

Mr. P. G. Capon said he thought when he started to write his communication that it might give some clue to the question of how, when and why teeth erupted, but it did not give any help at all, and apparently the cases shown by Mr. Johnson did not give any help in that respect. It was a curious clinical fact, which he thought Mr. Visick could confirm, that during the delayed vertical growth the children's teeth were almost entirely free from dental caries. Several of his cases had been in the same family; none of them suffered from deficiency of diet and none of them had caries, but as soon as the delay in vertical growth crased and the occlusion became normal they all tended to become carious. He had watched his cases month by month from the age of 4 years until the age of 12, and it was most interesting to see them developing as they did. He could not make any suggestions about why and how it happened, but he could not believe that it was due to ankylosis; he did not think ankylosis entered into the matter at all, because the teeth were usually lost at about the same time as they would have been if they had been in normal occlusion or the root absorption was approximately equivalent to what it would have been in that case.

Mr. H. C. Visick said that in the case which he had shown in his short communication the child had not had any caries at all.

Mr. K. E. Pringle, referring to the interesting point raised by Mr. Chapman of irregularities in twins sometimes occurring on the same side and sometimes on different sides, said he had watched that point over a number of years, and his experience was that in the majority of cases the irregularities occurred on the same side.

Mr. Trevor Johnson, in reply, said that in the case of the twins he had mentioned with a deficiency of growth, one of the children suffered from caries, though not severe caries ; there were very severe caries in the labial aspect of the molar, but apart from that it was occlusional caries. In the case of the twins without the deficiency, one had very severe caries and the other had none at all.

He agreed with Mr. Capon that the cause was not ankylosis, and he thought there was something to be said in favour of the suggestion he had put forward in his paper, namely, that the condition was due to heredity.

On the motion of **The President** a vote of thanks was accorded to Mr. Visick, Mr. Capon and Mr. Trevor Johnson, and the meeting then terminated.

Maxillo Facial Injuries in Children and their Sequelæ

By G. J. PARFITT, M.R.C.S., L.R.C.P., L.D.S.

I am going to show you this evening some slides taken from X-rays of cases of maxillo facial injuries in children which have considerable interest for the orthodontist, and in fact these cases would not have been collected together without such interest being present. There are two interesting features in the study of injuries in the child; the difference in healing as compared with that of an adult, and the effect of such injury on growth fulfilment; this last being the one I wish to discuss mainly this evening. Its importance lies in the fact that if an injury has some effect on the growing bone, then by the study of this defect, and by the comparison with the uninjured side of another individual of the same age, something may be learnt about the normal growth changes.

Forty or fifty accident and air raid casualties and some few osteomyelitis cases were treated alongside similar adult cases. These figures are far too small a number to give healing times of union of fracture as compared, for instance, with those of injuries in adults; but clinically, however (and numerous clinical observations were made upon each child), I would say that the child heals at least twice as quickly as the adult. This belief enjoys universal acceptance and there would be little point in mentioning it but for the fact that there are two end results to bone healing, union and non-union, and tissue breakdown and sequestration occur as rapidly as does uneventful healing; in fact the child's tissues heal just as rapidly wrongly as rightly. On the one hand a compound fracture heals with remarkable speed and tissue survival, with but little local reaction, on the other hand a relatively mild injury breaks down with quantities of pus formation, leading to early sequestration as well as early absorptive bone loss leading to early condition of the state of healing termed non-union.

One particular case of a girl of twelve showed X-ray appearance in the fracture area of non-union in 35 days after the injury. This appearance consists of rounding of the bone ends with the characteristic space between the rounded fragments. Such an appearance and diagnosis in an adult would be out of the question before perhaps six months after injury and in this particular case at the time was thought to be most unlikely, so that the fragments were immobilised for a further four months. The apparatus used was a cap splint to the teeth on each fragment connected by a bar which bridged the fracture, so allowing freedom of movement of the mandible without intermaxillary fixation, but rigid immobilisation of the two fragments. At the end of this four months' period the original diagnosis was confirmed, and after a further waiting period dictated by conditions other than the fractured jaw, a graft had to be done. The graft took uneventfully and with excellent speed.

In addition to the difference in the speed of reaction of the child's tissues there is, I believe, a high tissue resistance to infection, but when infection does take place there is a severe reaction to it. It was felt also, from the examination of wounds, that the young bone must be more resistant to fracture. Injuries were seen in the soft tissues which laid bare the mandible over considerable areas and this

protruding into the dressings was found to be unfractured, and moreover after gentle cleansing of the wound and suturing the soft tissues back into place, the bone survived uneventfully. No doubt these points were forced into relief by the great minority of injured children treated and had the numbers been reversed, no doubt the wearisome undramatic healing of the adult fracture, which we consider miraculously fast, would have been remarked upon.

Teeth involved in the fractured bone can be frequently retained in the child, but should infection occur about them more damage results. Some teeth clinically involved in fracture were unaffected; they continued to erupt into place and form roots correctly. Others involved continued to erupt but did not form roots. Figs. 1, 2 and 3 show such a case. The fracture was followed by sepsis and the lower border of the mandible over 1½ inches sequestrated. The teeth although clinically involved in the early stages, were retained as it was thought they were not contributing to the sepsis and tissue breakdown at the lower border, as the tissues about them were so healthy in appearance. The sequestrum separated early and the area healed immediately.

Fig. 1 shows the X-ray taken ten weeks after the injury with the fracture involving the $\overline{|45}$, and with $\underline{|e6}$ present. The sequestrum had already separated. Both the $\underline{|e}$ and $\underline{|6}$ were later extracted. Figs. 2 and 3 show the X-ray and occlusion 2 years 2 months after the fracture. It will be noted that there is lack of root formation upon $\overline{|45}$, but that $\underline{|3457}$ occlude with $\overline{|34567}$, and that $\underline{|7}$ has travelled a great distance in this time to come into occlusion. Note also the bone healing in the involved area.

Some teeth involved in fracture become apparently arrested in growth. The surrounding bone and teeth continue growing and erupt, leaving the injured teeth increasingly behind in the jaw at a considerably lower level. One such tooth was finally exfoliated practically four years after injury.

Sufficient has been said of the differences in healing. Interest is not confined to the injury and the healing of it, but to possible interference with growth.

A bone grows and increases in size both by bone formation upon its ends and in thickness by deposition by layer upon layer to its sides. In the main the growth of the mandible can be so described. It is of fundamental importance to understand that there is no

Fig. 1. Infected fracture ten weeks after injury $\overline{|45}$ involved.

Fig. 2. Same case as Fig. 1, two years two months after injury, lack of root formation on $\overline{|45}$.

Fig. 3. Same case as Figs. 1 and 2, showing occlusion at two years two months.

Fig. 4. Bone grafted to mandibular fracture in $\overline{|6}$ region, two weeks after operation showing wires *in situ*.

Fig. 5. Same case as Fig. 4, one year three months after graft.

Fig. 6. Same case as Figs. 4 and 5, two years ten months after graft.

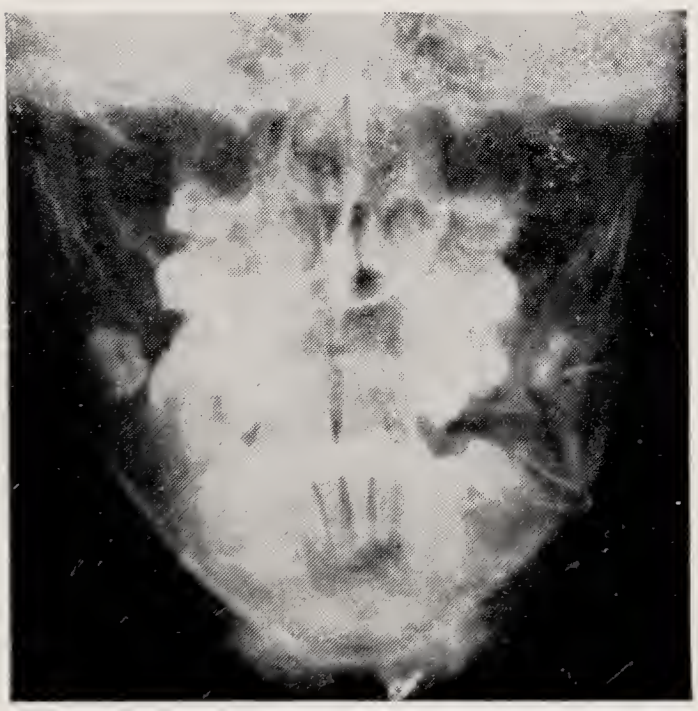

Fig. 7. Same case as Figs. 4, 5 and 6, four months after graft.

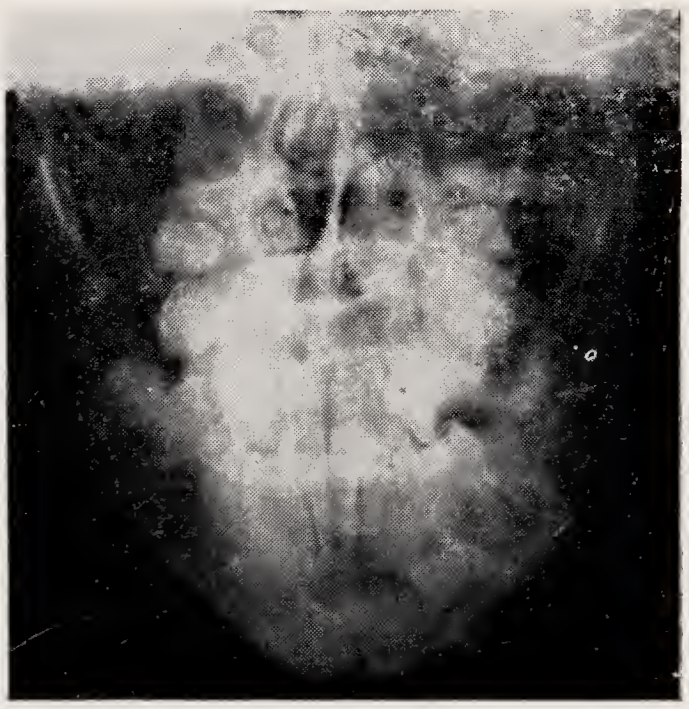

Fig. 8. Same case as Figs. 4-7, two years one month after graft.

Fig. 9. Same case as Figs. 4-8, two years ten months after graft.

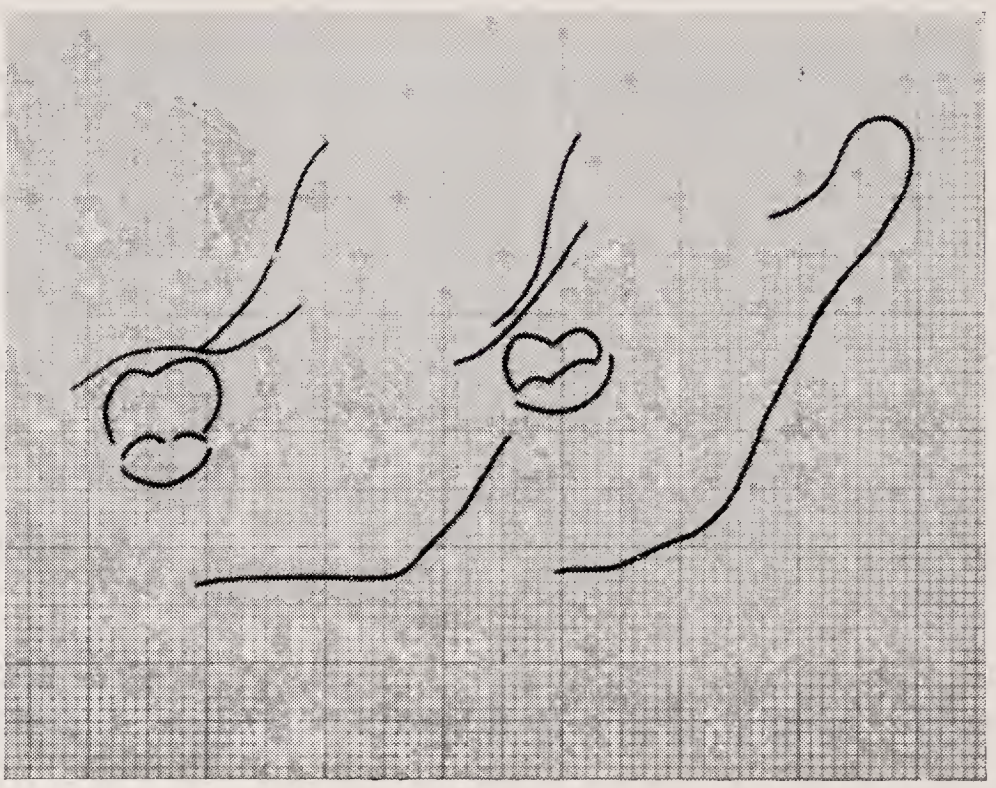

Fig. 10. Tracing of X-rays of angle of mandible, ascending ramus and $\overline{|8}$, of case Figs. 4-9 at early and late period, showing development of $\overline{|8}$.

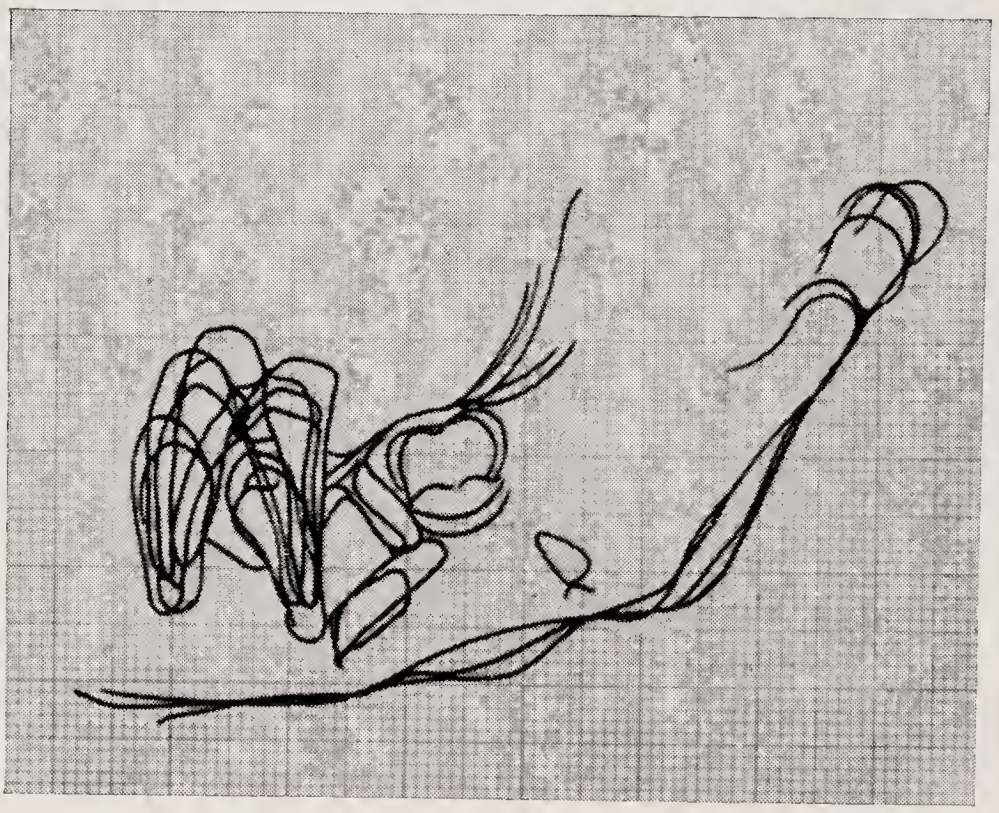

Fig. 11. Tracings of X-rays of case Figs. 4-9, superimposed upon wires inserted at bone graft; lateral views.

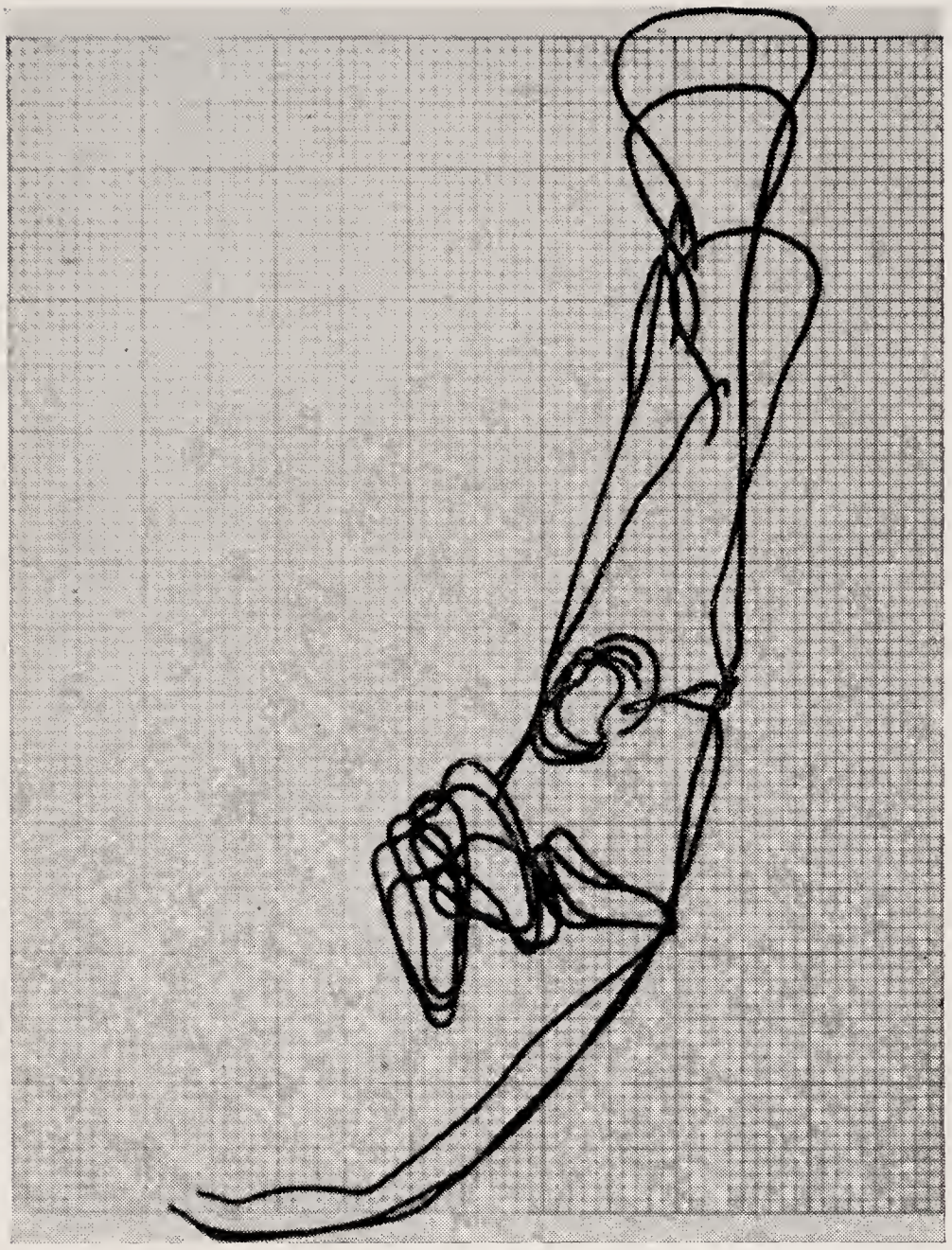

Fig. 12. Tracings of X-rays of case Figs. 4-9, superimposed upon wires inserted at bone graft, antero-posterior view.

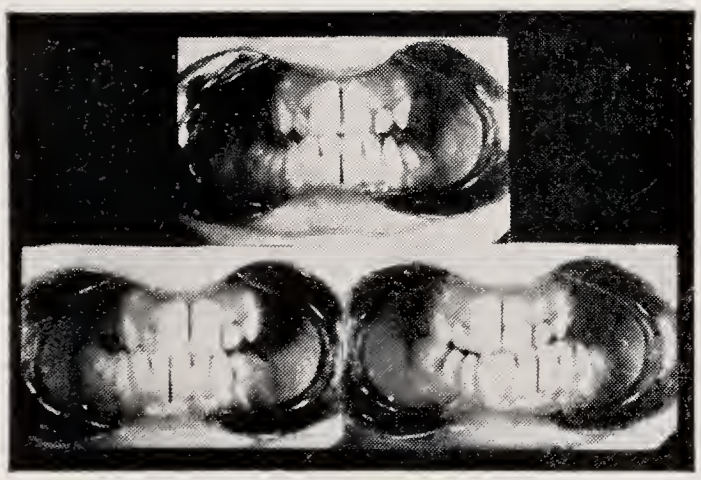

Fig. 13. Same case as Figs. 4-9, showing protruded bite and lateral excursion positions.

interstitial growth in bone ; no increase in length occurs by growth in the middle, but by addition to the ends only. Not that the central area of a bone is inert, for it is actively changing its pattern and structure, but such activity does not contribute to the increase in length.

Only two things can happen to any given element of bone after it has been laid down, either more layers of bone are laid upon its surface or it is absorbed at its surface.

A purely local injury to the middle of a bone may interfere with the local increase in thickness, whereas an injury to the growing end may interfere with its increase in length producing considerable deformity. Both these sequelæ are found in the mandible following upon injury. Growth changes of the mandible are more complex than those of a long

bone, both because of its shape and because of the presence of teeth. Local growth interference following injury may show as local lack of increase in thickness and also distributed tooth formation and eruption.

One particular case I wish to go into in some detail as it invites enquiry.

A child of nine years was bitten by a dog and fell, sustaining a fracture in the $\overline{|6}$ region. This was neither immobilised nor drained for twenty-one days. The fragments were then immobilised, the abscess drained and the necrotic tissue and loose teeth removed. The operation was followed by prolonged immobilisation, sequestration and non-union, and then a period of rest with all appliances removed. This rest was at that time our custom before bone graft operation. During this rest period the posterior fragment swung far forward. By superimposing the tracings of serial X-rays taken during immobilisation upon the shadows of the splints, the premolars were shown to be erupting, and the lower border apparently showed little change, and finally upon obtaining the X-ray after the splints had been removed for some months and superimposing this upon the tracings of the previous lower borders, the posterior fragment was shown to have swung far forwards. All these were clinically obvious facts. There was some justification in using the splints as a fixed point for the superimposition of X-rays, for these were cemented to the lower incisors and also fixed to the splints cemented to the upper teeth.

After this rest period had elapsed the bone graft operation was performed. A block bone graft from the hip was inserted in the ununited fracture area and was held in place by two stainless steel wires passing through the graft and fragments. These wires were left permanently *in situ*.

These two wires form possibly a unique superimposition point for fracture X-ray pictures in a growing child, and repeat the classical experiments of Duhamel and John Hunter, in which lead shot and wires were inserted into the limbs of animals and birds in order to study their growth. The value of these wires for superimposition of X-rays lies in the fact that as there is no interstitial growth they will not move apart on that account. They were one inch apart. The only way that these wires can move is by involvement in fibrous tissue contraction or by local abscess formation. Tissue changes external to the bone will have but little effect, for the wires were twisted tightly against the bone surface beneath the periosteum.

In the study of growth change superimposition of X-rays upon points external to the bone may indicate growth changes as a whole, but cannot show absorption or deposition of bone to any given surface ; for such an estimate by this method fixed points must be obtained within the bone itself.

The follow-up of this case now held great promise, except for the difficulty of obtaining subsequent X-rays with plate, head and tube in identical positions over a period of months and years. This ideal is well nigh impossible. The pictures I managed to obtain of this case vary, but this does not make superimpositions of tracings valueless, but it does prevent any accurate measurements. The inaccuracy increases with the distance from the wires, the greatest accuracy being in the area between the wires themselves ; in this case this is a featureless area. An assessment of the accuracy of the positioning of the X-rays can be made by noting the widely separated bony points on the plate, such as the right and left angles of the mandible and the hyoid arch, seeing that these make comparable patterns on the plates, and those pictures which have not been taken sufficiently near to the identical angle are discarded, as they are not comparable. Antero posterior views are also compared for in the positioning of the patient for this shot, the wires and the condyle head are on a plane parallel to the plate and at right angles to the X-rays, a condition which minimises inaccuracies

due to positioning, and in these condyle growth can be observed, by again superimposing subsequent X-rays upon the wires.

By casual observation of Figs. 7, 8 and 9 it can be seen that the length of the ascending ramus has increased, and when tracings are superimposed upon the wires (Fig. 12) it can be seen that the condyles have grown to a considerable extent.

Kelsey Fry pointed out years ago that on clinical observation the main growth of the mandible was the condyle area. This was from the study of cases of facial deformity where one condyle had been damaged and ceased growth, so producing a short ascending ramus. Martin Rushton has lately again pointed this out by a series of histological studies of growing condyles. This case has brought this point well home to me. Figs. 5 and 6 show tilted lateral X-rays of the graft area, one month, one year three months, and two years ten months after the wires were inserted at bone graft, and Fig. 11 shows superimposed tracings of six X-rays over that period.

Various points can be noted ; the premolars have erupted and have changed their position in a curve, the centre of which is situated posterior to the teeth. Increase of ascending ramus has been brought about by growth of the condyle. The angle of the mandible and posterior border of the ascending ramus have grown by surface deposition and the anterior border of the ascending ramus has been absorbed so that the front edge has moved distally. The $\lfloor \overline{8}$ has changed its position but little during this time period and little change has occurred at the lower border, but the relative positions of the $\lfloor \overline{8}$ and the anterior border of the ascending ramus has altered as shown by tracings in Fig. 10. In the early tracing the ascending ramus if projected would pass in front of the mesial border of the tooth, whereas in the later tracing (Fig. 10) the projection of the ascending ramus would pass near to the posterior border of the tooth. The $\lfloor \overline{8}$ has moved forward a little perhaps as the $\lfloor \overline{67}$ have been extracted, but some of this change, I believe, has been brought about by absorption of the anterior border of the ascending ramus in this particular case. Moulding changes of the graft area will also be noted from Figs. 4-9. Another important detail is that the anterior wire itself has altered position during the first months, taking up a more vertical position and thereafter showing but little change. I believe this to have been brought about by involvement of fibrous tissue contraction about its upper end. In Fig. 4 it will be seen the non-union area of the alveolus mesial to the $\lfloor \overline{8}$ has been left ungrafted and that the wire approaches this area of scar tissue ; in Fig. 5 one year three months later this area has filled with bone and the wire has changed position slightly, swinging about its twisted ends situated at the lower border. Fig. 13 shows the teeth in the protruded forward bite and in the right and left excursion, showing excellent movement. The clinical assessment of this case is that the main growth area (the condyle region), remained unaffected, producing little or no facial deformity in spite of the severe local injury, over an extended period of time.

Fig. 20 shows a low-power microphotograph of a section through the head of the condyle of a child. The growing cartilaginous cap can be seen with bony replacement beneath it, which provides the growth addition to the bone. Absorption can be noted anteriorly in the neck of the condyle at the site of the muscle attachment, perpetuating through the growth changes the shape of the condyle head and neck.

My next case is one of osteomyelitis of the mandible involving the condyle (Figs. 14-19).

A child of six years was admitted with osteomyelitis following upon abscess and tooth extraction ; and after three operations for drainage sequestrated a large portion of bone (Fig. 14) including the angle, the ascending ramus, the distal two-thirds of the condyle itself and the $\lfloor \overline{7}$.

Fig. 14. X-ray of sequestrum removed at operation.

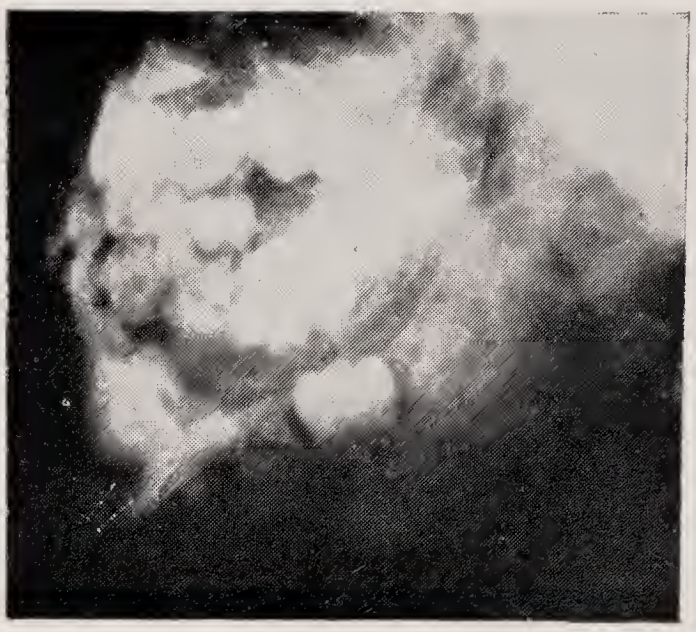

Fig. 15. Osteomyelitis of mandible in child *aet.* 6, three months after onset.

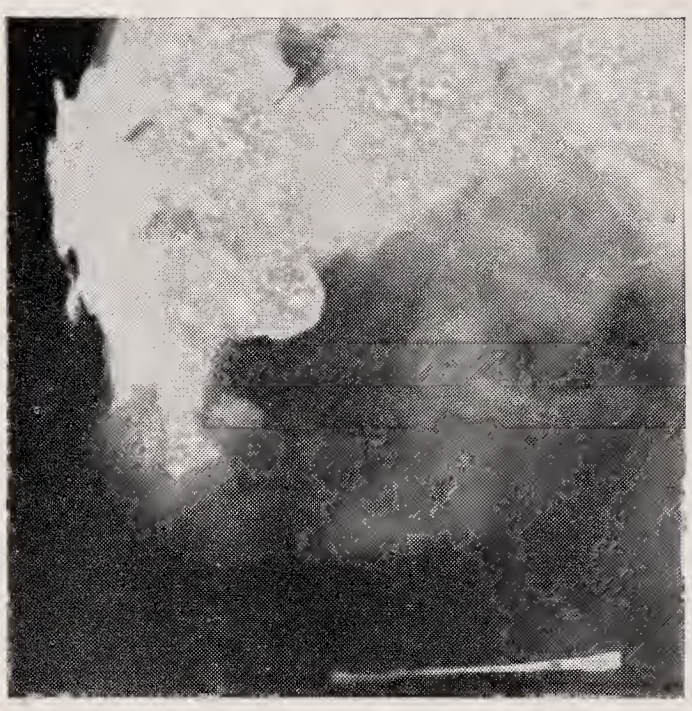

Fig. 16. Same case as Fig. 14, five months after onset of disease.

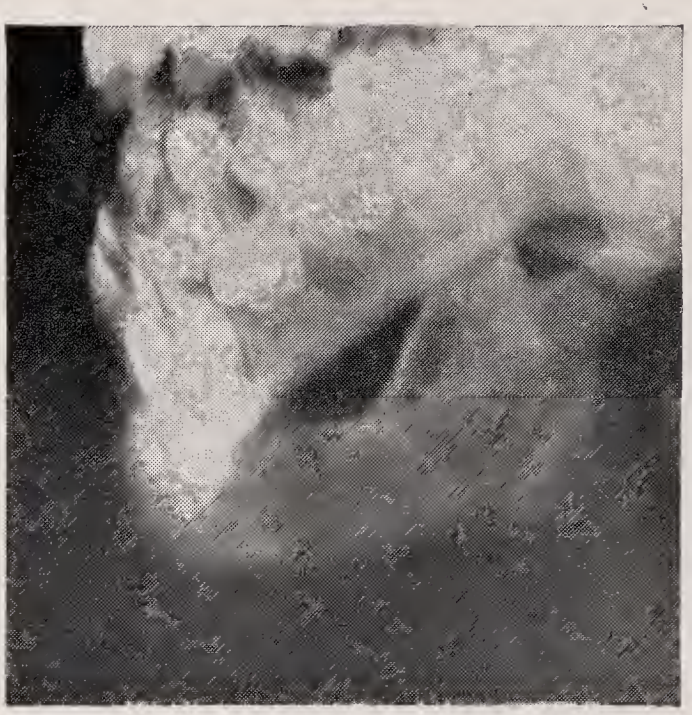

Fig. 17. Same case as Figs. 14 and 15, ten months after sequestrectomy.

Fig. 18. Same case as Figs. 14, 15 and 16, five months after onset.

Fig. 19. Same case as Figs. 14-17, ten months after sequestrectomy.

Fig. 15 shows the lateral X-ray of the affected side three months after tooth extraction. The distal two-thirds of the condyle can be seen to have separated from the anterior portion. Fig. 16 shows the condition after a further two months drainage and Fig. 18 the antero-posterior view at the same period. An excellent local recovery ensued (Figs. 17 and 19), the whole area being replaced by bone, but I am afraid the remaining condylar tissue will be unable to keep pace with the opposite side and I expect therefore some deformity will result as the child grows up.

The deformity produced by such disease and discontinuance of growth of one condyle is shown in Figs. 21, 22 and 23. I have examples of ankylosis of one or both condyles following osteomyelitis, after fall, after scarlet fever, after mastoiditis, and after condylectomy and in one case the original disease was unknown. The deformity in unilateral disease, Fig. 21, is a short ascending ramus upon the injured side with displacement of the chin to that side, and the consequent flattening of the face upon the opposite side. This causes gross asymmetry. With bilateral disease there is symmetrical bilateral underdevelopment of the lower jaw.

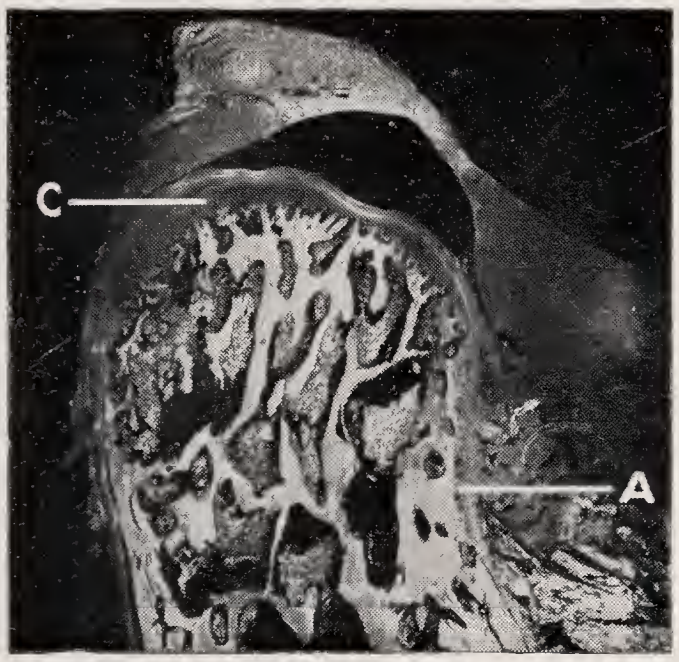

Fig. 20. Microphotograph of condylar head of child, showing cartilaginous growth process.
A, Absorption. C, Cartilaginous Cap.

Fig. 21. Facial deformity following osteomyelitis at age of four to right side of mandible, normal left side showing flattening.

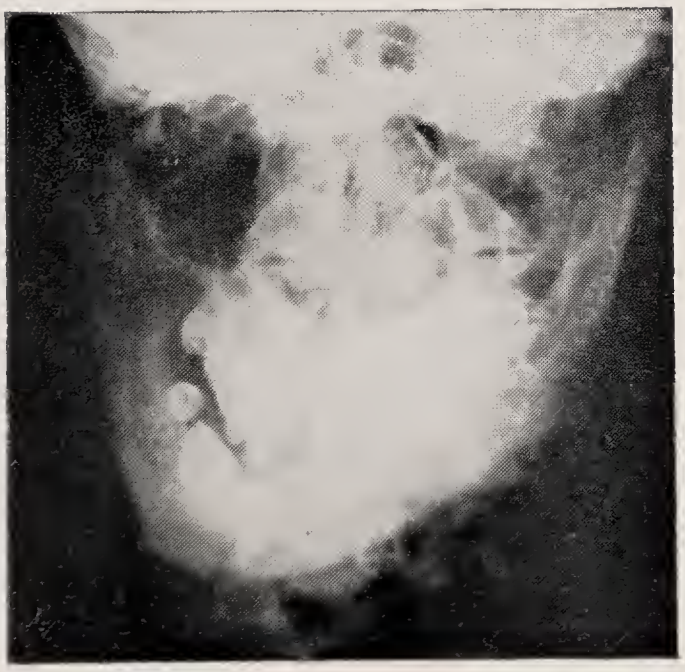

Fig. 22. Same case as Fig. 21, X-ray in antero-posterior position.

Fig. 23. Same case as Figs. 21 and 22, lateral X-ray of right side of mandible nineteen years after osteomyelitis, showing deformity.

Fig. 23, of osteomyelitis following abscess upon a tooth at age four—the lateral view of the case shown in Figs. 21 and 22—shows a compensatory growth effort of the angle region of the mandible in a downward direction. This area is the muscle attachment and this growth effort has been noted to a lesser degree in several cases. These photos and X-rays were taken 19 years after the disease process, the patient being now 23 years of age.

This series of individuals was examined 10-25 years after the original mishap and showed to some extent this deformity. I have heard of a case of gross asymmetry such as this following simple fracture of the condyle without infection ; and so with some misgiving I again followed up some of our condyle fractures in children, for if the condyle is so misplaced, growth must surely suffer. Fortunately, however, no such serious case had come our way and the examples of condyle fracture have continued without deformity. The injury in these cases cannot have interfered with the growth in this region.

I should like to thank Mr. Kelsey Fry for his continual help and encouragement and for discussing the subject matter of this paper, Mr. McLeod and Mr. Rae Shepherd who treated all the cases with me, Professor Sheldon Friel for guidance and discussion upon many points, Miss Davies for the radiographs, Miss B. Maddocks for photography and making the slides, Mr. Martin Rushton who lent me the micro-section of a growing condyle head from which the slide was made, Mr. McIndoe who performed the bone graft operation, and Mr. Eckhoff for X-rays of his cases.

DISCUSSION

The **President** said that the paper dealt with an unusual theme. Now that the war was over, one of the chief causes of maxillo-facial injuries in children was at an end, but there were still road accidents, which were on the increase, so the problem of dealing with such injuries still existed.

As he lived in a coastal town which had had over a hundred bombing raids during the war, he had seen many cases of jaw injuries, including a number of children.

About a year ago he had seen a girl of about 14 years of age who had met with a road accident. The condyle was fractured on the right side and the mandible was fractured in the premolar region on the left side. Cap splints were made, but about six weeks later there was found to be mal-union in the mandible. He did not know the reason, but it would not heal. He felt that the child ought to be sent to East Grinstead, but civilian cases were not wanted there, so he continued his treatment. The child was a delinquent in many ways, and eventually she ran away, but she was brought back and when the ligatures were removed the mal-union was found to be still in existence. When he saw her about three months ago, after she had been in an approved school, he was surprised to find that, although the mal-union still existed, the deformity had disappeared and the fibrous union was so good and solid that there was no need for any further treatment. The teeth on the left side were not in occlusion at all when the splints were taken off, and the gap had been gradually widening, but apparently the function of mastication had done what immobilisation had failed to do.

Mr. L. R. Marsh said that he would like to thank Mr. Parfitt for a most instructive paper. Mr. Parfitt had had unique opportunities of seeing cases of maxillo-facial injuries in children, and the record he had made of them was very valuable.

With regard to the case which Mr. Parfitt had shown in which the premolars had erupted in a sort of curve, he would like to point out that, when the second premolar was unsupported by molar teeth behind it, it tended to erupt far back in the jaw, and he wondered

whether that ought to be taken into account in measuring that premolar and its neighbour. It was quite possible that those teeth would normally have been a little farther forward and that therefore in the tracing they would have shown a further growth forward in the anterior part of the jaw than they actually showed.

He had noticed that the photographs of children showed them to be brunettes at the time of the accident and blondes when the treatment had been completed. He did not know whether that change had been due to the treatment.

He would like to know whether the bone grafts were always taken from the hip.

Mr. Parfitt, referring to the first point raised by Mr. Marsh, said that the case in question was a very severely damaged one, in which the gap between the 8 and the 5 was very small, and one could not argue from that case to the normal case. Where the two teeth would normally go and what would happen in a normal case he did not know.

With regard to the apparent change in the colour of the children's hair, the first photograph was taken with a portable camera and the exposure was very difficult and gave a tar and whitewash effect, whereas the second photograph was taken with a standing camera, which gave a better exposure.

As to the bone graft, he had done bone grafting in only one case, and then the bone was taken from the iliac crest. A very interesting point was that when he cut down to the iliac crest he found, instead of the normal hip, a glistening cartilage.

Mr. H. G. Watkin said he thought the members should be very grateful to Mr. Parfitt for the tremendous amount of trouble that he had taken in obtaining the photographs which he had shown.

He would like to ask Mr. Parfitt what treatment he had given to the case of osteomyelitis to which he had referred. Had it occurred before the time of penicillin ?

Mr. Parfitt replied that the case of osteomyelitis had occurred just before penicillin had begun to be used. The treatment for such a case was to open up the cavity widely and clean it out thoroughly, removing all dead bone, and allow it to drain. It could be closed up again if penicillin was used and the surgery was scrupulous. The penicillin should be given by intramuscular injection, two tubes being put in, and that treatment should be continued for about a week.

Dr. E. S. Friel said that he also would like to thank Mr. Parfitt very much for his paper. Mr. Parfitt had very kindly given him prints of the X-rays that he had shown, also tracings of them, and he had been particularly interested in the movement of the second premolar. In a paper read before the Royal Society of Medicine recently it had been stated that premolars did not go backwards after the loss of deciduous molars and first permanent molars, and he thought the case shown by Mr. Parfitt, in which the deciduous molars had gone and both the first and second molars had been lost, was a unique one. On the whole he thought that the second premolar had not moved distally, certainly not as far as the root was concerned. If anything, it had gone slightly medially, but the crown, as it erupted and came above the surface of the alveolus, seemed to have tilted backwards, owing perhaps to want of support of a tooth behind it and possibly to mastication acting on it.

Another point in which he was interested was the alteration in the ascending ramus. He thought, from Professor Brash's and Mr. Broadbent's work, that the ascending ramus did not absorb on the anterior surface and that all the room for the molar teeth was made

by a movement forward of the teeth through the bone, but Mr. Parfitt's X-rays showed a definite amount of absorption as well as deposition on the posterior surface. The antero-posterior measurement of the ascending ramus, from the first to the last measurements taken, remained exactly the same, which showed that the absorption and deposition must be of equal amounts.

Mr. H. Chapman said that in listening to Mr. Parfitt he had felt that the late Dr. Northcroft would have been very interested in the paper, not only because it dealt with an entirely new subject for the Society but also because Dr. Northcroft had always insisted that there was no such thing as interstitial growth and would have been very pleased to hear that view so completely confirmed by Mr. Parfitt.

It was exceedingly interesting to see how the condyle progressed backwards. Last week he had had an opportunity of seeing how children recovered from what might seem to be a severe extraction. In the cases in which the laterals erupted but the deciduous and centrals remained there was invariably a supernumerary tooth in relation with each permanent incisor that had erupted. The case to which he was referring was that of a boy aged 11, who had two unerupted permanent centrals and two supernumerary teeth lying labially to them. Those supernumerary teeth, which were quite deep and fairly large, were removed one Tuesday, and by the following Tuesday the mouth had healed up perfectly by first intention except in a very small area. He did not know where the centrals were, but he thought they must be about half-way back in the palate, because the supernumerary teeth which were removed were not very near the front, and the centrals were still farther back.

He wished to congratulate Mr. Parfitt on his very excellent presentation of the subject dealt with in the paper.

Mr. O. N. Catchpole referring to the case of osteomyelitis described by Mr. Parfitt, in which half of the condyle had been separated, said it appeared that Mr. Parfitt had waited five months before removing that piece of bone and he would like to know how he had decided when to remove it.

Mr. Parfitt, in reply, said he would have liked to remove the piece of condyle a considerable time before it was in fact removed, but there were numerous people treating the case and the ordinary teaching, which was very difficult to break down, was that the treatment for osteomyelitis was to drain an abscess when it occurred and, when the discharge had finished or perhaps after 48 hours, to take the drain out. The abscess healed up and the child was sent home, and three months afterwards it often happened that the abscess formed again. If one went into the history of osteomyelitis cases treated in England and Wales one would find that children sometimes went into hospital eighty times ; in one case a child had had its ninetieth operation for drainage.

The teaching given by Mr. Mowlem, however, was different ; it was not new, but Mr. Mowlem had put it on the map. He himself had had the good fortune to work under Mr. Mowlem for a year. This teaching was that the abscess in osteomyelitis was an abscess of the centre part of the bone—a bone marrow abscess—and the bone cortex, the periosteum and the soft tissues round about it were all part of the localising mechanism to keep the condition localised. He had been amazed at the results which Mr. Mowlem obtained and the results obtained by those who followed Mr. Mowlem's treatment. As soon as he was certain that the case with which he was dealing was a severe case of osteomyelitis, Mr. Mowlem drained the abscess ; he took the lower border of the mandible away, and, before the days of penicillin, he kept

the cavity open. In that way he reduced cases from ten years to six months. When penicillin was discovered he continued that treatment ; he even cut farther back still, so as to be absolutely certain that there was no dead bone left at all in the cavity, and he sewed it up, which people had not dared to do before, because of the danger of further sepsis and possibly the loss of the whole of the lower jaw. Mr. Mowlem, with penicillin and complete confidence in his treatment, was certain that he would get quicker healing, because he would collapse the whole cavity and it would heal everywhere. He sutured back the tissues, holding them back on to the bone which he had cleaned, and put penicillin tubes in. If there was a little bit of dead tissue left in, it was dealt with by the penicillin. At first Mr. Mowlem used general penicillin as well, which he himself liked to do, but he was not sure whether Mr. Mowlem used that now ; he had not been in contact with him for some time. Personally he liked to give a week's course of up to 1,000,000 units, because he was very much impressed with the effect of general penicillin treatment, both in this country and overseas, on war injuries, the wounds becoming very clean and healthy. Penicillin treatment and scrupulous surgery should go hand in hand.

When one was certain, either by X-rays or by probing, that a piece of bone was separated, it should be taken out, the bone should be cut back, penicillin tubes should be put in and the whole thing should be sutured up.

He thought it would be many years before Mr. Mowlem's teaching was established on a sound basis in all the hospitals of this country. Mr. Mowlem had read an excellent paper on it at the Royal Society of Medicine, but it had been strongly criticised by the die-hards, who were disinclined to give up the old teaching.

Mr. R. E. Rix said he would like to thank Mr. Parfitt very much for the unique series of X-rays which he had shown. With regard to what happened along the anterior border of the ascending ramus, he believed that Professor Brash had said that there was a very slight amount of absorption of bone along the anterior border, not by any means enough to provide room for erupting molars, because they had to move mesially and occlusally to get into place. There was one name which should not be forgotten in connection with the growth of the mandible—Mr. Wilson Charles. He believed that it was Mr. Wilson Charles who had first shown the importance of growth in the condyle region, and Mr. Rushton's work had amply confirmed that.

Major N. W. Holland said he was doubtful whether penicillin was of use locally. He had been dealing with about a thousand cases of fractures and had tried penicillin in about a hundred of them, and he had not come to any conclusion on the question whether it helped or not. He was rather sceptical about the value of local penicillin tubes.

Mr. Parfitt said he thought that local penicillin tubes did very little good, and he took them out after about twenty-four hours, but he thought it was worth while to put them in, in case any little pieces of bone had been left behind. In the case of gunshot wounds, if the bullets could be wrapped up in penicillin it might do some good, but in a case in which there were damaged tissues and which the surgeon saw one or two days after the injury he did not think that penicillin locally did any good at all. If it was to do any good, he thought it must be given at the time of the operation. Local penicillin tubes would not put life back into a piece of dead bone and would not make an abscess become smaller and heal up ; the abscess must be surgically drained and treated. Penicillin would not make a bad surgeon's work good, but it would make a good surgeon's work better.

Mrs. E. E. Clausen asked what happened to the inferior dental nerve in the case of osteomyelitis to which Mr. Parfitt had referred. Did it regenerate at all after it had been destroyed ?

Mr. Parfitt said he had never known it to be regenerated, but the patients became used to its absence. He had looked up about thirty cases and found that most of them had considerable numbness, but that improved, he thought because the nerves took over the function. People got used to a lack of sensation and did not notice it.

On the motion of the **President,** a vote of thanks was accorded to Mr. Parfitt for his paper.

REPORTS OF MEETINGS

An Ordinary Meeting of the Society was held at Manson House, 26, Portland Place, W.1, on Monday, March 6th, 1944, at 5 p.m. Mr. S. A. Riddett, the President, occupied the Chair.

The Minutes of the previous meeting were read, confirmed and signed.

Captain Goldstein, a new member, was introduced to the President and welcomed by him.

The following candidates for membership of the Society were unanimously elected by show of hands :—

Captain S. D. Goosman, D.D.S.Penn. (U.S. Forces in Europe).

Miss E. M. Young, L.D.S.Edin., 55, Eton Rise, Eton College Road, N.W.3.

P. Rover, L.D.S.Liv., 3, Green Terrace, Rosebery Avenue, E.C.1.

An apology for absence was announced from Mr. W. G. Senior, Dental Secretary of the British Dental Association, who had been invited to attend the meeting.

The PRESIDENT welcomed the visitors who were present and asked them to consider themselves members of the Society for the evening and to take part in any discussion if they wished to do so.

ANNUAL GENERAL MEETING, 1944

The Annual General Meeting for the year 1944 was held at Manson House, 26, Portland Place, London, W.1, on Saturday, December 9th, 1944, at 2 p.m. The retiring President, Mr. S. A. RIDDETT, occupied the chair during the first part of the meeting, being succeeded later by Mr. N. GRAY, the President for 1945.

OBITUARY

The PRESIDENT announced with great regret the death of three members of the Society since the last meeting, namely, Mr. Rover, Mr. Fouraker, and Mr. Ovey. Mr. Rover had been killed by enemy action and his wife had been killed at the same time. Mr. Fouraker had attended the meetings of the Society very regularly, and Mr. Ovey was also well known to the members, having been at one time the Society's Treasurer.

The members stood in silence.

MINUTES

The Minutes of the Ordinary Meeting held on March 6th, 1944, were read and were confirmed and signed.

ELECTION OF OFFICERS AND COUNCILLORS

The PRESIDENT said that no nominations other than those made by the Council had been received, and the following would therefore be the Officers and Members of Council for 1945 : President, Mr. N. Gray ; Immediate Past President, Mr. S. A. Riddett ; Vice-Presidents, Mr. R. E. Rix, Mr. M. Rushton and Mr. L. R. Marsh ; Secretary, Mr. R. Cutler ; Treasurer, Mr. H. Chapman ; Curator, Miss L. Clinch ; Editor, Mr. J. F. Pilbeam ; Librarian, Mr. A. G. Taylor ; Councillors, Mrs. L. Lindsay, Mr. C. F. Ballard and Mr. G. J. Parfitt.

ELECTION OF TWO HONORARY AUDITORS

The PRESIDENT said the members would recall that at the last Annual Meeting, on the recommendations of the two Honorary Auditors,

professional Auditors had been appointed, but the Honorary Auditors continued to give advice on the activities of the Society. Mr. S. B. Newton and Mr. L. Boness had served as Honorary Auditors for the whole of the war period, and their advice had been of great help to the Council. He thought it would be advisable to re-elect Mr. Newton and Mr. Boness for the ensuing year, particularly in view of the difficulties that might be encountered in the immediate post-war period, and he moved accordingly.

The resolution was carried unanimously.

Report of the Hon. Treasurer

The Hon. Treasurer (Mr. H. Chapman) reported as follows on the financial affairs of the Society for the year ended September 30th, 1944 :—

The accounts, audited by professional Auditors for the first time, as well as by two members of the Society, are circulated this afternoon. It is intended in normal times to send these to members with the agenda of the Annual Meeting.

The Auditors, in conformity with usual practice, have reduced the assets as compared with last year's figure by the increase in value of the investments and have increased them by the value of furniture, etc., at the figure at which I valued them in my Report last year. This figure was not included in the accounts.

The increased value to-day over cost of the Savings Certificates is £337 5*s.* 10*d.* (present value £737 5*s.* 10*d.* Cost £400).

The 2½ per cent. Consolidated Stock shows a small loss of under £5 on the purchase price.

Further expenditure incurred by the Committee considering Education is £40 14*s.* 11*d.* It is not expected that there will be any further payments under this head.

There are additional liabilities, which I do not anticipate will exceed £100.

The property of the Society is as last year, and the insurance remains the same.

The Members' Auditors, Messrs. Newton and Boness, have made valuable suggestions in regard to the accounts, which it is hoped to adopt in the coming year.

Mr. S. B. Newton, in moving the adoption of the Report, congratulated the Society on seeing its furniture and office equipment included in the Balance Sheet. That brought the total assets to over £1,700, which was very creditable.

He understood that the Treasurer had to wait to pay accounts until they had been passed by the Council, but, if the Treasurer could have a free hand in paying accounts in the case of normal expenditure, many of the items which under the present arrangement had to remain outstanding could be included in the current financial year, which he thought would be more satisfactory.

The expense incurred by the Education Committee seemed to be fairly large. In looking through the Members' Register he noticed that a number of distinguished members of the profession had resigned their membership of the Society after war broke out, owing no doubt to becoming rather anxious about their financial position. He thought a note from the Secretary might bring them back into the Society.

He thanked the meeting for re-electing him as an Honorary Auditor. The duty of the Honorary Auditors was to see that the funds of the Society were properly spent, whilst the duty of the professional Auditors was merely to see that the cash book agreed with the bank pass book.

The Hon. Treasurer, replying to Mr. Newton, said there was a bye-law which prevented his paying any accounts over £5 without

the sanction of the Council, and as the Council did not meet very often the payment of such accounts was necessarily delayed. The ending of the financial year on September 30th would not bring about any improvement in that connection, because usually the meeting of the Council previous to that date was held on the first Monday in May, so any accounts of over £5 which came in after that date could not be paid until after the October meeting of the Council.

He thought the total cost of the Education Committee, extending over two or three years, had been about £125.

The Report of the Hon. Treasurer was adopted.

Report of the Hon. Secretary

The Hon. Secretary (Mr. R. Cutler) reported as follows :—

I have to report that only one meeting, in addition to the present Annual General Meeting, has been held during the current year, as certain meetings planned for the latter part of the year were cancelled in view of enemy activity in the London area.

The Council, however, has met six times, and the Special Committee has also had long meetings on many occasions prior to the completion of its work after the middle of the year.

Majority and minority reports on post-graduate teaching and treatment of the elementary school child were prepared, approved and distributed to members and the appropriate Government committees sitting, and the original draft report on undergraduate teaching was again discussed and made the subject of final majority and minority reports : the majority report was circulated to members, Government committees and the dental schools, and copies of the minority report were also made freely available. This completed the work of the Special Committee, which then dissolved, the results of its deliberations and decisions being on permanent record.

To commemorate the death of the founder and first President of the Society, the late Dr. George Northcroft, it has been decided to hold a meeting triennially, to be called The Northcroft Memorial Meeting, at which a speaker of outstanding merit will be invited to address the Society.

In view of the hoped-for cessation of hostilities in the European theatre during the ensuing year, a full programme has been envisaged, the bulk of the meetings being arranged for the middle and latter parts of 1945, and largely due to the efforts of Mrs. Lindsay, our programme secretary, the list is virtually completed, and will be made available to members in due course.

The publication of the *Transactions* for 1942 and 1943 have been repeatedly delayed for reasons beyond the Society's control, but our Editor hopes for their release at the earliest possible date.

The state of the membership has been under constant review by the Council, and every effort has been made to contact Service members and to acquaint them with Society activities, and the recently instituted Service section of the members list still includes names of past members who have not replied to our enquiries, as it is felt that difficulties of communication may have prevented them from so doing.

The Society has lost one newly elected member by enemy action, the death of Mr. P. Rover being mentioned by our President to-day, and the present strength of active membership is 209, 8 have resigned, 2 have died, and 7 have been removed from the list for non-payment of subscriptions ; 10 names are at present held under review for various reasons.

At the last Council meeting the view was expressed that the members should be reminded of their rights in connection with election of fresh members to the Council, the large majority of the present members having served for the greater part of the war period, but as no nomina-

tions have been received, it is assumed that the officers, as nominated on the Agenda paper, have the approval and support of the membership for the ensuing year.

The Report was adopted.

Report of the Hon. Librarian

The Hon. Librarian (Mr. A. G. Taylor) reported as follows :—

The Society now subscribes to the *Journal of the American Dental Association*, the *Angle Orthodontist*, and the *American Journal of Orthodontics*. Mr. Chapman has very generously offered to present copies of the *Journal of the Pacific Coast Society of Orthodontics*, the *British Dental Journal*, and the *Dental Record*, and this offer has been gratefully accepted by the Council of the Society.

The present housing of the Library still makes it difficult to offer a proper service to members, but both books and journals are borrowed, and with the coming of peace, or perhaps a little sooner, we shall be able, we hope, to give members a full and proper library service.

The Report was adopted.

Report of the Hon. Curator

The Hon. Curator (Miss L. Clinch) reported as follows :—

During the year models have been received from Messrs. Bragg and Wookey and from the late Mr. Fouraker. Also a large number of serial models and slides which belonged to the late Dr. Northcroft and which will probably be very valuable, have been given to the Museum by Mr. Garrow.

Arrangements are being made for the accommodation of the Library and Museum at 26, Portland Place, London, W.1, where it is hoped that the contents of the Museum will be able to be inspected by the members. An announcement will be made later when the cabinets have been installed and the specimens put in their places. An announcement will also be made as to when Mr. Gordon Taylor will be on the premises to give books to the members who require them.

The Report was adopted.

Statement by the Hon. Editor

The Hon. Editor (Mr. J. F. Pilbeam) said that he much regretted the delay in sending the *Transactions* to members, but it was quite unavoidable. The Dental Manufacturing Company had had difficulties with regard to the printing and also staff difficulties. He hoped that copies of the *Transactions* would be sent to members within the next few weeks. All matters considered at the Society's meetings had been published in the *Dental Record*.

The President said he was sure all the members would wish to thank Mr. Pilbeam for continuing to act as Editor.

Amendment of Bye-law XXIV

Mr. H. Chapman, in moving that the following words be deleted from Bye-law XXIV : " . . . . payments, the financial year ending on October 31st in each year," said the object of the proposed amendment was to facilitate ending the financial year on September 30th each year, so that the members could receive the printed accounts with the notice of the Annual General Meeting in December. If the financial year ended on October 31st there was hardly time for that to be done, but, if it ended on September 30th, it was considered that in normal times that would give sufficient time for it to be done. If it did not and if there was no date stated the Council could make the date whatever they thought fit.

Mr. R. E. Rix seconded the resolution and it was carried.

Recommendations by the Council

The Hon. Secretary said the Council recommended: "(*a*) That the Officers nominated for 1945 be the same as those holding office at the end of 1944 with certain alterations as indicated on the list appended." That merely drew attention again to the election of Officers and Councillors for 1945. If no nominations were received from members three weeks before the date of the Annual General Meeting, the Officers and Councillors suggested by the Council were declared elected automatically, as had been the case at the present meeting. If members wished to make any comments about future elections to the Council which might help the Council in its work during the coming year they now had an opportunity to do so.

The Council's recommendation was approved.

The Hon. Secretary said the Council also made the following recommendation: "(*b*) That in view of the hoped-for cessation of hostilities in the European theatre of war during 1945 every effort be made to hold regular meetings, and to this end the following dates have been provisionally selected: Monday, February 5th (Presidential Address); Monday, May 7th; Monday, June 4th; Monday, October 1st; Monday, November 5th; and Monday, December 3rd (Annual General Meeting)."

The recommendation was approved.

Election of Members

The following candidates for membership of the Society were elected *en bloc*: R. V. Tait, L.D.S., Bankside, Wolsey Road, Moor Park, Middlesex; N. W. A. Holland, L.D.S. (Major, A.D. Corps), c/o Midland Bank, Queen Square, Wolverhampton; B. R. Townend, L.D.S., 131, Manygates Lane, Sandal, Wakefield, Yorks; Miss E. M. Myers, L.D.S., c/o National Provincial Bank, Barnet, Herts; C. A. Tinn, L.D.S. (Captain, A.D. Corps), Army Dental Centre, British Legion House, Beaverbank Villas, S. Queensferry, Scotland; and J. Appleton, L.D.S., Glenburn, Marple Bridge, Nr. Stockport, Cheshire. The President welcomed Dr. T. B. Layton to the meeting and invited him to give his address on "Chewing as a Therapeutic Measure."

The President, in proposing a vote of thanks to the Officers and Councillors of the Society, said he thought it would be agreed that the past five years had not been unworthy ones from the point of view of the Society and its traditions. The credit for that was shared by many, but the thanks of the Society were specially due to Mr. Cutler, its gifted Secretary, to Mr. Chapman, who had stepped into the breach as Treasurer, to Mrs. Lindsay for her many activities, particularly as Programme Secretary, to Mr. Pilbeam and Miss Clinch, the Chairman and Secretary respectively of the Special Committee, which had met many times, with great success, and to all the other Officers and Members of Council. The thanks of the Society were also due to the many members who by their support and attendance at the meetings had contributed so much to the success of those functions.

The vote of thanks was accorded with acclamation.

The President thanked the members for their loyalty to him during his five years' term of office as President, and then inducted Mr. Norman Gray into the chair.

Mrs. Lindsay proposed a vote of thanks to Mr. Riddett for his long and valuable services to the Society as President.

The motion was carried with acclamation.

The President (Mr. Norman Gray) thanked the members for the honour they had conferred upon him in electing him to the Presidential Chair and referred to the great work which Mr. Riddett had done for the Society. He had felt it a great privilege to be associated with Mr. Riddett on the Council, and appreciated his cheerful and generous spirit.

He believed that this country was going forward very quickly to the time of peace and that days of great opportunity for orthodontists lay ahead. Their work covered a tremendous field, and they would have an even greater part to play in the future than they had had in the past. He would do all he could for the Society during the coming year and hoped that the members would give him their support.

The meeting then terminated.

An Ordinary Meeting of the Society was held at Manson House, 26, Portland Place, London, W.1, on Monday, February 5th, 1945, at 4 p.m. Mr. NORMAN GRAY, President, occupied the chair.

The Minutes of the previous meeting were read and were confirmed and signed.

The PRESIDENT welcomed the visitors who were present and expressed the hope that they would take part in any discussion that evening if they wished to do so.

Mr. R. V. Tait, a new member, was introduced to the President.

The following candidates for membership of the Society were unanimously elected :

V. G. Pedley, L.D.S., 43, Welbeck Street, W.1.

Miss Rachel Sclare, L.D.S., 36, Francis Street, Leeds 7.

R. B. Dockrell, B.Dent.Sc.(Eire), Termon, Sandycove, Avenue W., Dun Laoghaire, Co. Dublin.

The PRESIDENT then delivered the Presidential Address.

The Demonstration meeting took place on May 7th, 1945. The President was in the chair.

There was a large attendance and members greatly enjoyed the excellent demonstrations given by Mrs. Michaelis, Miss Smyth, Miss Clinch, Miss Still, Mr. Catchpole, Mr. Chapman and Mr. Watkin.

The President heartily congratulated those who took part in the demonstrations and he had a special word of thanks for the school children treated by Miss Still at a London County Council Orthodontic Clinic, who showed excellent results of treatment.

A vote of thanks proposed by the President was received with great enthusiasm.

The President stated that this was a great day—after nearly six years of war we were emerging victoriously from the war in Europe. He hoped, as indeed everybody wished, that the war in the East would soon terminate and that we could look forward to the days of peace.

The meeting then terminated.

An Ordinary Meeting of the Society was held at Manson House, 26, Portland Place, London, W.1, on Monday, June 4th, 1945, at 7 p.m. Mr. NORMAN GRAY, President, occupied the chair.

The Minutes of the previous meeting were read and were confirmed and signed.

The PRESIDENT welcomed the visitors who were present and expressed the hope that they would take part in the discussion which was to be held.

The following candidates for membership, who had been declared by the Council eligible for election, were elected *en bloc* : Dr. Ragnar Granerus, Stortorget I. Nassjo, Sweden (corresponding member) ; Mrs. Una Oliver, L.D.S.Bristol, 4, Spencer Hill, Wimbledon ; John Murray, L.D.S.Glasgow, 14, Albyn Place, Aberdeen ; Mrs. M. C. Strange, L.D.S.(Eng.), 55, Lee Road, Blackheath, S.E.3 ; G. M. Fitzgerald, B.Dent.Sc.Dublin, Bloomsbury Club, 34, Cartwright Gardens, London, W.C.1 ; G. Richards Smith, L.D.S.(Eng.), Rosslyn, Woking, Surrey ; and E. J. Perks, L.R.C.P., M.R.C.S., L.D.S., Angle House, St. Austell, Cornwall.

The PRESIDENT then invited Miss L. Clinch to open the discussion : " The Orthodontist in the School Dental Service," and was followed by Mr. J. F. Pilbeam.

An Ordinary Meeting of the Society was held at Manson House, 26, Portland Place, London, W.1, on Monday, October 1st, 1945, at 7 p.m. Mr. Norman Gray, President, occupied the chair.

The Minutes of the previous meeting were read and were confirmed and signed.

The President said he would like to welcome any visitors who might be present and to invite them to take part in the discussion on the paper which was to be read.

The following recently elected members were introduced to the President: Mr. V. Pedley and Mr. E. J. Perks.

The following candidates who had been declared by the Council eligible for election were elected *en bloc*: Mrs. E. E. Clausen, L.D.S., 61, Carlton Hill, St. John's Wood, N.W.8.; Mrs. P. S. Miller, L.D.S., 42, Lansdowne Road, West Didsbury, Manchester, 20; Mr. F. C. Shenton, 166, Ring Road, Halton, Leeds, Yorkshire; Miss A. S. Stewart, Dental Clinic, Health Centre, Brentford, Middlesex; and Mr. C. A. Ta'Bois, 33, High Road, Woodford Green, Essex.

The President then invited Prof. E. Matthews to read his paper: "A Layman Looks at Orthodontics."

An Ordinary Meeting of the Society was held at Manson House, 26, Portland Place, London, W.1, on Monday, November 5th, 1945, at 6 p.m. The President, Mr. Norman Gray, occupied the chair.

The Minutes of the previous meeting, held on Monday, October 1st, 1945, were read and were confirmed and signed.

The President said he would like to welcome any visitors who were present and to express the hope that they would take part in any discussion that arose.

Dr. John Murray, a newly elected member of the Society, was introduced to the President, who welcomed him and admitted him as a member.

At this meeting Mr. H. C. Visick gave a short communication: "Arrested Growth of the Jaws, associated with a 'depressed molar'."

Short papers were given by Mr. P. G. Capon on "Glossoptosis," and Mr. Trevor Johnson on the "Unusual Variation in Identical Twins and its Etiology."

ANNUAL GENERAL MEETING, 1945

The Annual General Meeting of the Society for the year 1945 was held at Manson House, 26, Portland Place, London, W.1, on Monday, December 3rd, 1945, at 6 p.m. Mr. Norman Gray, President, occupied the Chair.

Minutes

The Minutes of the Ordinary Meeting, held on November 5th, 1945, were read and were confirmed and signed.

Election of Officers and Councillors

The Hon. Secretary (Mr. R. Cutler) said that, as no other nominations had been received, the following, who had been nominated by the Council and whose names were given on the Agenda, would be the Officers and Councillors of the Society for the year 1946: President, Mr. R. E. Rix; Immediate Past President, Mr. N. Gray; Vice-Presidents, Mr. H. C. Visick, Mr. R. Cutler, Mr. M. Rushton, Mr. L. R. Marsh; Secretary, Mr. K. Pringle; Treasurer, Mr. H. Chapman; Curator, Miss L. Clinch; Editor, Mr. J. Pilbeam; Librarian, Mr. A. G. Taylor; Councillors, Mrs. L. Lindsay, Mr. C. F. Ballard, Mr. G. J. Parfitt.

Election of Two Auditors

On the motion of Mr. L. S. Levien, seconded by Mr. H. Chapman, Mr. W. L. Boness and Mr. S. B. Newton, were re-elected Honorary Auditors for the ensuing year.

Report of the Hon. Treasurer

The Hon. Treasurer (Mr. H. Chapman) said that this year, for the first time, the accounts had been circulated with the Agenda for the Annual General Meeting, and, also for the first time, the accounts showed a deficit, amounting to £82. The situation, however, was not as bad as it appeared to be, and, in fact, the Society was solvent.

It would be noticed that the cost of printing the *Transactions*, £120, covered two years, 1942 and 1943, and if half that amount was taken for one year the deficit was reduced to £22. The position could be made to appear still better, because some of the items of expenditure, totalling £65, were non-recurring items. They consisted of repairs to the cabinets, £17 (the repairs had cost £57, but nearly £40 had been recovered from the Government); expenses of the Committee on Education, £25; expenses in connection with the welder, £5, and expenses in connection with the printing of the Report of the Education Committee, £16. The Council, of course, might sanction other non-recurring items of expenditure in future. The subscriptions were £40 less than in the preceding year, owing to the resignation of twenty members and the payment of arrears for 1944, amounting to £20. It would therefore be seen that the accounts could be adjusted to show an excess of income over expenditure. The deficit of £22 to which he had referred could be subtracted from the non-recurring items of expenditure, which would leave a sum of £42, and if the £40 difference in subscriptions was added the result was a balance of income over expenditure of £82.

He had said at the last Annual Meeting that the further expenses incurred by the Education Committee were £40, but actually the total was £42, being £25 for travelling and £16 for printing.

He had not allowed any sum for depreciation of furniture, and he did not think that had ever been done in the Society's accounts. The ordinary depreciation had recently become appreciation. That was a point that would probably be taken into consideration in the accounts in future.

The *Transactions* had been published only up to 1943, so the *Transactions* for 1944 and 1945 had yet to be published and paid for. He thought the cost of that would probably be about £130. There was still some rent to be paid from October last, and that, with the £130 and sundry items, would amount to a liability of about £175.

On behalf of the Council, he wished to thank Mrs. Lindsay for allowing several of the Council meetings to be held in her room.

On the motion of the Hon. Treasurer, which was seconded, the Report was adopted.

Report of the Hon. Secretary

The Hon. Secretary (Mr. R. Cutler) said that the programme for the last session had been completed as planned. Six meetings had been held, the average attendance having been forty. Twenty-two new members had been elected, three members had resigned, and some names had been removed from the list of members owing to non-payment of subscriptions. As far as could be ascertained, the present membership was 230, but difficulty was still experienced in effecting contact with certain members on Service. The Council hoped that many of those members would before long take up active membership again. At present it was not the policy of the Council to remove the names of such members from the membership list.

It should be set on record that, with the proposed resumption of stencilled addresses for notices, it was of paramount importance that members should supply the Honorary Secretary with their permanent mailing addresses. Members were advised to get into touch immediately with the newly elected Honorary Secretary, Mr. Kenneth Pringle, 12, Manchester Square, London, W.1 if they had experienced any difficulty with regard to the receipt of notices during the past year.

The year under review had been noteworthy for the victorious conclusion of the world war, peace in Europe having been proclaimed the day after the Society's May demonstration meeting. The members should not be unmindful of the fact that the successful organisation of the meetings held during the past session had been made possible only by the preliminary planning of the Council and particularly by Mrs. Lindsay, the Programme Secretary, during the latter rather difficult part of 1944. The attendance and the enthusiasm shown at the meetings would seem to have fully justified the confident policy of the Council in the matter, and with the prospect of more settled conditions in the future the further success of the Society appeared to be assured.

On the motion of Mrs. LINDSAY, seconded by Mr. H. G. WATKIN, the Report of the Honorary Secretary was adopted.

REPORT OF THE HON. LIBRARIAN

The HON. LIBRARIAN (Mr. A. G. Taylor) said that the Library, with the Museum, had been moved to the Institute of Public Health, next-door to Manson House, and was not yet in proper order.

No new Reports had been added to the Library during the year under review, but the Society subscribed to the *American Journal of Orthodontics and Oral Surgery*, the *Journal of the American Dental Association*, and the *Angle Orthodontist*, of which no copies had yet been received. The Society also received the Reports of the Odontological Section of the Royal Society of Medicine.

During the year under review, lending from the Library had been practically restricted to Journals.

The Report was adopted.

REPORT OF THE HON. CURATOR

The HON. CURATOR (Miss L. Clinch) said that she was still sorting out the contents of the Museum, which, as Mr. Taylor had mentioned, was now housed at the Institute of Public Health.

Models had been received during the year from Miss Smyth, Mr. Gray, Mr. Newton, Mr. Pringle and Mr. Visick.

The HON. SECRETARY said that Miss Clinch's Report did not do justice to the very large amount of work that she had done in getting the Museum organised in its new quarters and the material displayed to the best advantage. He thought the members ought to know that Miss Clinch had done so much work in that connection.

The Report was adopted.

ELECTION OF MEMBERS

The HON. SECRETARY announced that the following candidates for membership of the Society had been approved by the Council, and they were thereupon elected *en bloc* :—

H. A. Anderson, L.D.S., 4, Clifton Place, Sauchiehall Street, Glasgow, C.3.

W. R. Burston, L.D.S., 15, Somerville Road, Wigan, Lancashire.

A. G. Clark, L.D.S., 8, Mornington Avenue, Ilford, Essex.

M. Galinsky, L.D.S., 43, Barrington Crescent, Stockton-on-Tees.

C. A. J. Heath, L.D.S., Pinewood House, Worplesdon Hill, Woking, Surrey.

H. Mandiwall, M.B., B.S., L.D.S., 234, Staines Road, Hounslow, Middlesex.

INTRODUCTION OF NEW MEMBERS

The following recently elected members were introduced to the President :—Mrs. E. E. Clausen, Mrs. U. Oliver, Mr. C. A. Ta'Bois.

The PRESIDENT welcomed the visitors present and invited them to take part in the discussion that would follow the reading of the paper by Mr. G. J. Parfitt on " Maxillo-Facial Injuries in Children and Their Sequelæ."

BRITISH SOCIETY FOR THE STUDY OF ORTHODONTICS

STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 30TH SEPTEMBER, 1944.

RECEIPTS.

	£ s. d.	£ s. d.
To Interest on Investments	15 19 8	
,, Members' Subscriptions 1943-4 (including one 1945 subscription and one 1946 subscription)	264 12 0	280 11 8
		£280 11 8

PAYMENTS.

	£ s. d.
By Rent—Manson House	18 6 0
,, Refreshments	7 2 11
,, Hon. Treasurer's Petty Cash Expenses	5 19 7
,, Dental Manufacturing Co. (Printing)	38 12 0
,, Printing and Stationery	39 19 5
,, Reporting	4 4 0
,, War Damage Insurance	3 2 6
,, Committee Meeting Expenses	28 3 5
,, General Expenses, Bank Charges, etc.	3 0 6
,, Credit Balance	132 1 4
	£280 11 8

BALANCE SHEET, AS AT 30TH SEPTEMBER, 1944.

LIABILITIES.

	£ s. d.	£ s. d.
Accumulated Balance as at 1st October, 1943	1,951 12 11	
Add Excess Receipts over Payments per Account, 30th September, 1944	132 1 4	
	2,083 14 3	
Less Adjustment for revaluation of Investments	294 17 4	
		1,788 16 11
		£1,788 16 11

ASSETS.

	£ s. d.	£ s. d.
Investments—		
500 National Savings Certificates, valued at Cost	400 0 0	
£639 13*s.* 3*d.* 2½% Consolidated Stock, valued at Cost	525 11 6	
		925 11 6
Cash at Bank	... ...	229 0 10
Cash in Hand—		
Hon. Secretary	2 5 7	
Hon. Treasurer...	1 19 0	
		4 4 7
Furniture and Office Equipment as at 30th September, 1943	... ...	630 0 0
		£1,788 16 11

We have examined the Books and Vouchers of the Society and certify the foregoing Receipts and Payments Account and Balance Sheet to be correct.

FREDK. B. SMART & Co.,
Chartered Accountants,
22, Queen Street,
London, E.C.4.

16th November, 1944

THE BRITISH SOCIETY FOR THE STUDY OF ORTHODONTICS

INCOME AND EXPENDITURE ACCOUNT for the Year ended 30th September, 1945.

	£	s.	d.
To Storage Rent	10	12	6
,, Repairs	57	10	0
,, Printing—Transactions, 1942-3 ... £120 18 7			
Report 16 17 6			
General 23 1 6			
	160	17	7
,, Postage	14	10	3
,, Meeting Expenses	18	18	0
,, Reporting	8	8	0
,, Refreshments	8	13	4
,, Insurance	1	2	6
,, Lighting	2	5	3
,, Removal Expenses	2	12	3
,, Travelling Expenses	30	14	11
,, Audit and Accountancy Fee	5	5	0
,, Sundries	2	0	6
	£323	10	1

	£	s.	d
By Members' Subscriptions	225	3	6
,, Interest on Investment	15	19	8
,, Excess of Expenditure over Income for year to date	82	6	11
	£323	10	1

THE BRITISH SOCIETY FOR THE STUDY OF ORTHODONTICS

BALANCE SHEET as at 30th September, 1945.

	£ s. d.	£ s. d.
ACCUMULATED FUND :—		
Balance 1st October 1944 ...	1,788 16 11	
Less : Excess of Expenditure over Income for Year to date	82 6 11	
		1,706 10 0
CREDITORS :—		
Printing	120 18 7	
Storage Rent	4 7 6	
Subscriptions in advance	2 2 0	
		127 8 1
		£1,833 18 1

	£ s. d.	£ s. d.
FURNITURE AND OFFICE EQUIPMENT :—		
Balance, 1st October 1944 ...	630 0 0	
Less : Sales during year	8 10 0	
		621 10 0
INVESTMENTS AT COST :—		
500 National Savings Certificates	400 0 0	
£639 13*s.* 3*d.* 2½% Consolidated Stock	525 11 6	
		925 11 6
(The Market Value of the Consolidated Stock at 30th September 1945 was £567 7*s.* 11*d.*)		
CASH AT BANK		285 13 0
CASH IN HAND :—		
Hon. Treasurer	1 8 9	
Less : Overdrawn — Hon. Secretary	0 5 2	
		1 3 7
		£1,833 18 1

Certified in accordance with the Books and Vouchers of the Society. We have verified the Investments and Cash at Bank.

FREDK. B. SMART & CO.
Chartered Accountants.
22, Queen Street,
London, E.C.4.

23rd October 1945.